THE ADOPTION OF OPEN INNOVATION AS A FORM OF MANAGEMENT INNOVATION AND ITS IMPACT ON INDIVIDUALS

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CERTIFICATE OF ORIGINALITY

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ABSTRACT

There are many types of innovation, but traditionally innovation research has been focused on technological forms of innovation by disregarding the notion of non-technological forms of innovation. Management innovation (MI), a type of non-technological innovation, is adopted to improve managerial routines and practices, yet management innovation is one of the most understudied elements in innovation research. Literature suggests that nowadays, organisations do not generate innovations within their organisational boundaries; rather, they need to open up for external collaborations. This suggestion implies that opening up of organisational boundaries will impact managerial practices, and as such, it is essential to understand how managerial practices are transformed under organisational openness. The concept of organisational openness has been coined as open innovation (OI), and it is one of the most popular elements in the innovation literature. However, very little is known about individuals who participate in the process of opening up and how this practice impacts their work routines and responsibilities; instead, the majority of OI literature is focused on organisational outcomes. The close examination of the literature suggests that OI activities share the same characteristics as MI, and as such, this study argues that the adoption of and participation in OI can be viewed as MI.

Thus, this study's main objective is to explore the research link between the concepts of OI and MI by conceptualising the adoption of OI as MI from the individual perspective. Specifically, this study aims to understand how the adoption of and participation in OI practices as MI impacts individuals and their work-related performance.

This study adopted qualitative research methods that contributed to answering the research questions and meeting the research objectives to explore the phenomenon under consideration. In particular, this study conducted 22 semi-structured online interviews with individuals that represent different industries and regions. In addition to the qualitative data analysis, a text-mining application was used to analyse the results further.

The findings revealed that the adoption of OI practices is MI, as it contributes to changes in management routines and organisational structures by shifting employees' responsibilities. Additionally, the application of the Technological, Organisational, Environmental and

Individual (TOEI) framework allowed us to conceptualise the adoption of OI as MI from the individual perspective and to explore previously unknown factors as well as to understand how factors from different contexts interact and impact the adoption of OI practices, e.g., international experience, office layout, and reputation as a multilevel factor. The post-adoption examination revealed that OI's adoption as MI improves employees' performance and enhances their career opportunities.

The results of our study offer original contributions for the research community and practitioners. Firstly, this is one of the first studies that establish the research link between two innovation fields, open innovation and management innovation. Secondly, this study contributes to an emerging line of inquiry on the "human side" of OI and MI research by identifying essential OI and MI micro-foundational factors, e.g., international experience. Thirdly, the findings provide a crucial contribution to understanding individual-level outcomes by highlighting how individuals benefit from participating in open innovation activities- this consideration may help organisations to reduce work-related stress and improve staff retention among employees.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

PUBLICATIONS

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CHAPTER 1. INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Innovation continues to be a popular topic among researchers and practitioners, because it is a critical component in the prosperity and survival of not only organisations but also societies, and it is a major source for competitive advantage. Despite the importance of innovation as a research topic, the majority of research about it remains techno-centric. In other words, researchers are focused on analysing innovations in the form of technology or products (e.g., Černe et al., 2016; Crossan and Apaydin, 2010; Damanpour, 2014; Keupp et al., 2012). According to a systematic review conducted by Keupp et al. (2012)[1], out of 342 articles only 25 analysed non-technological forms of innovation, whereas 246 articles were about technological innovations. Such disparity is at odds with a long-established notion of non-technological forms of innovations (e.g., Birkinshaw et al., 2008; Černe et al., 2016; Daft, 1987; Damanpour et al., 1989; Damanpour and Aravind, 2012; Volberda et al., 2014).

Management innovation is a type of non-technological innovation. According to Birkinshaw et al. (2008), management innovation can be defined as: *"the generation and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals."* (p.829). In other words, "*put simply, management innovation changes how managers do what they do"* (Hamel 2006, p.71). Examples of management innovation include, but are not limited to, Six Sigma for Motorola, Total Quality Management (TQM), the global account management structure for Hewlett-Packard Co., which later became a standard for managing international clients and others (Birkinshaw and Mol, 2006). These and other examples of management innovation demonstrate that it has a positive impact on the dynamic capabilities of organisation (e.g., Nieves, 2016) and that it contributes to financial and innovation performance (e.g., Černe et al., 2015; Gunday et al., 2011). Most importantly, however, management innovation facilitates the successful adoption of technological innovations (e.g., Černe et al., 2015;

[1] There are no recent systematic reviews that cover non-technological innovation. Thus, the systematic reviews by Crossan and Apaydin (2010) as well as by Keupp et al. (2012) are the most cited in the research area. even among the most recent studies (e.g. Khosravi et al. 2019; Simao et al. 2020)

Hollen et al., 2013). This suggests that an organisation that wants to implement a new technology or product have to ensure that its managerial practices, processes, structures or techniques can support the adoption process.

Despite the benefits and importance of management innovation, its research domain remains very limited and lacks an understanding of what factors facilitate the adoption of management innovation as well as the outcomes associated with it (e.g., Khosravi et al., 2019; Simao et al., 2020; Volberda et al., 2014). For example, a systematic review by Khosravi et al. (2019) demonstrates that, unlike technological innovations, there is no systematic evidence on how the innovation characteristics (e.g., relative advantage, complexity, cost reduction etc.) of management innovation impact on its adoption. Similarly, a bibliometric analysis on management innovation conducted by Simao et al. (2020) suggests that due to a lack of empirical evidence we can only assume that the innovation characteristics of management innovation may impact on its adoption. In addition, Simao et al. (2020) state that the adoption of management innovation depends on individuals that participate in the process, not only on individuals that drive the process, but also on employees who are asked to participate in the process and how it might impact on them. Although the role of individuals in management innovation has been long emphasized by scholars in the form of internal and external change agents (Birkinshaw et al., 2008; Volberda et al., 2014) or types of leadership that contribute to the adoption of management innovation (e.g., Douglas et al., 2016; Karatepe et al., 2020; Vaccaro et al., 2010), an understanding of how management innovation happens at the individual level is largely absent from the current literature (e.g., Khosravi et al., 2019; Simao et al., 2020). On this note, Volberda et al. (2014) state the following: *"For a fuller understanding of the concept of management innovation, we must understand the individuals who identify problems, search for solutions, provide ideas, and make decisions" (p.1259).* In other words, for a better understanding of management innovation a deeper investigation into what factors facilitate the adoption of management innovation, in particular at the individual level, is needed.

According to Simao et al. (2020), since organisations may not generate innovations within their organisational boundaries, the adoption of management innovation can be impacted by external sources of knowledge, and as such, organisational openness is an important factor. On this note a study by Damanpour et al. (2018) found that in cases when the impact of internal sources is low, external sources might impact on the adoption of managerial

innovation. The concept of organisational openness was coined by Henry Chesbrough as the open innovation paradigm (OI) in his seminal book *Open Innovation: The new imperative for creating and profiting from technology* (Chesbrough, 2003a). According to Chesbrough and Bogers (2014) open innovation is: "*…a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with each organization's business model"* (p.17). Organisations that want to engage in open innovation can do so by opening up their business model in two directions, namely *inbound* and *outbound* open innovation. While inbound open innovation can be described as an application of external knowledge for internal innovation processes, the outbound open innovation can be described as an outward transfer of unused knowledge. These two types of open innovation form the original notion of the paradigm as per Chesbrough (2003a) and include a number of practices. For example, inbound open innovation can come in the form of open source, beta-testing, outsourcing, crowdsourcing and others, whereas outbound can be represented as innovation providers, out-licensing etc. (Stanko et al., 2017). These open innovation practices are usually used by scholars to study the adoption of the paradigm and its impact (e.g., Brunswicker and Chesbrough, 2018; Chesbrough and Brunswicker, 2014; de Araújo Burcharth et al., 2014 etc.). Similar to these and other OI related studies, this study defines open innovation as an umbrella term that incorporates inbound and outbound open innovation practices. In other words, this study considers open innovation, i.e., the process of opening up, as an application and participation in one of these practices; the practices applied are not limited to the existing OI practices, but also include the ones that have the similar nature (more on this in section 5.2 of chapter 5; the full list of the OI practices can be found in Appendix D).

By reviewing the open innovation and management innovation literature, it is noticeable that both open and management innovation share conceptual similarities based on the characteristics of management innovation as identified by Birkinshaw et al. (2005), Mol and Birkinshaw (2008), Mol and Birkinshaw (2009). These characteristics are *implementation, exhibition of novelty, alteration of the management work*, and *intention to further organisational goals* (more on these in chapter 2 of this study). Birkinshaw et al. (2005), Mol and Birkinshaw (2008), Mol and Birkinshaw (2009) suggested these characteristics in order to demonstrate that not all managerial practices can be perceived as management innovation, but only the ones that can show similarities across these four characteristics. For example, according to Birkinshaw et al. (2005) and Mol and Birkinshaw (2009), an

application of MI has to alter the full range of management daily activities, such as practices, processes and structures, rather than solely impacting managerial ideas or beliefs (Abrahamson, 1996; Barley and Kunda, 1992; Kramer and Kramer, 1975). From this perspective, a study by Alexy et al. (2013) suggests that the application of open innovation in the form of open source eventually changes individuals' job structures. Similarly, a study by Lifshitz-Assaf (2018) demonstrates that the implementation of the open innovation practices in the form of crowdsourcing, a type of inbound open innovation, among NASA teams affects R&D professionals as they have to go through identity transformations, but the ones who do not accept open innovation practices fail to convert solutions obtained through crowdsourcing into business processes. Altogether this suggests that the application of the open innovation practices and the participation in the it can be considered as management innovation, and as such, there is a possibility to explore the application of open innovation beyond its traditional technological or product application.

In addition to the above, although this discussion demonstrates that the application of open innovation can impact individuals, to date (with the exception of a few studies) very little is known about individuals who engage in the open innovation practices and the outcomes of such engagement. From this angle, open innovation is also similar to management innovation as both lack an understanding of individual-level analysis, as demonstrated earlier in this chapter. With regard to open innovation, such a research discrepancy can be explained by the fact that until recently open innovation has been studied at the firm-level of analysis only. However, scholars have long acknowledged that open innovation can occur at different levels of analysis and there is a need to address other levels of analysis for a better understanding of open innovation antecedents and its outcomes (e.g., Bogers et al., 2017; Chesbrough and Bogers, 2014; West et al., 2014). As such, there has been increasing academic attention to analysing open innovation beyond the firm level with a particular focus on its micro-foundations, i.e., the individual-level (e.g., Ahn et al., 2017; Bogers et al., 2018b; Badir et al., 2019). Still, based on a recent review on open innovation, our understanding of the individual-level perspective is not adequate (e.g., Gao et al., 2020). According to Bogers et al. (2017), to date very little is known about how individuals experience the adoption of open innovation and what challenges they may encounter. In addition to Alexy et al. (2013) and Lifshitz-Assaf (2018), the only other study that analyses the individual level outcomes is a study by Salter et al. (2014) that discusses the challenges of external engagement in R&D and proposes four coping strategies. This indicates that if participation in open innovation

activities can be viewed as management innovation, then as a new managerial practice, it will demonstrate different effects on individuals rather than what occurs at the organisational level of analysis, e.g., enhanced innovation or financial performance.

To support the arguments made above, a bibliometric analysis of the intellectual structure of non-technological innovation by Černe et al. (2016) suggests that some of the open innovation activities, e.g., looking for external collaborations, organising for institutional partnerships, which are inbound open innovation practices, can be viewed as a non-technological activity that in turn can have technological outcomes. This suggestion by Černe et al. (2016) supports our earlier notion that open innovation can have a non-technological aspect to it, though there are a few differences. Firstly, Černe et al. (2016) consider management innovation as a form of non-technological innovation and marketing innovation, green innovation, open innovation etc. like other forms of non-technological innovations. In this study we, however, argue that the adoption of open innovation practices can be considered as management innovation. Secondly, Černe et al. (2016) discuss the technological outcomes of open innovation, while in this study we show the importance of analysing the individual level outcomes.

Taking the above into account, the main motivation of this study is to examine the adoption of open innovation practices as a form of management innovation. In order to do so, this study applies the TOE framework created by DePietro et al. (1990) to provide a systematic understanding of innovation diffusion at the individual-level of analysis. By marrying these two research streams this study will address the following research gaps:

1) Conceptualise OI adoption as a form of management innovation and explore how both research domains can be connected and where they overlap.

Based on the analysis of management innovation literature, it is noticeable that there has been some interest in linking management innovation and open innovation. This could be due to the fact that, unlike management innovation, open innovation is one of the most popular topics in innovation literature and its strengths can help to address the weakness of management innovation. The previous studies in this field, however, analysed the impact of external knowledge sources (Damanpour et al., 2018) on the implementation of management innovation. The only study to date that considers management innovation as open innovation is the one offered by Mol and Birkinshaw (2014), but the authors focus only on the role of

external sources as management innovation and how it is associated with creation of systemic or radical innovations. A recent suggestion has been made by Simao et al. (2020) to expand the management innovation domain to open innovation. Taking this suggestion into consideration, our study extends previous knowledge and offers a novel perspective: that the application of and participation in open innovation practices can be viewed as management innovation by integrating the two domains together rather than analysing each of them separately. Additionally and unlike the study by Mol and Birkinshaw (2014), this study also examines outbound open innovation.

2) Understand the individual level perspective of OI as well as MI adoption.

As demonstrated earlier in this chapter both domains demonstrate a lack of research that analyses the individual-level perspective. According to Salter et al. (2014), the absence of the individual level perspective in open innovation research may explain why some organisations fail to adopt open innovation. While open innovation research demonstrates increasing scholarly attention to the micro-foundations of open innovation (e.g., Bogers et al., 2018b; Badir et al., 2019), the same cannot be said for management innovation literature. Based on the systematic review by Khosravi et al. (2019) it can be seen that the evidence present is outdated and limited to a very few studies. According to Volberda et al. (2014), more research is needed on the micro-foundations of management innovation in order to understand what motivates change agents to adopt management innovation. Additionally, Simao et al. (2020) identify the individual-level perspective as an important research direction. Thus from this perspective, this study will address the recent research calls on the micro-foundations of open innovation (Bogers et al., 2017) and management innovation (e.g., Simao et al., 2020).

3) Analyse the individual level outcomes associated with the adoption of open innovation as a form of management innovation.

While on the organisational level of analysis the adoption of open innovation is associated with enhanced financial and innovation performance, very little is yet known about the individual level outcomes with the exception of a few studies that deal with R&D professionals (e.g., Alexy et al., 2013; Lifshitz-Assaf 2018). As for management innovation, the systematic review by Khosravi et al. (2019) demonstrates that there are no studies that investigate the individual outcomes. Rather, most of the work in the area is focused on

capabilities outcomes, innovation outcomes and performance outcomes. However, an understanding of the individual level outcomes is important since the adoption of management innovation impacts on managerial work routines and structures, and as such, might make employees less engaged and stressed in their jobs. Thus, from this perspective our study will extend the previous knowledge of open innovation and address the gap in the management innovation literature.

1.2 RESEARCH OBJECTIVES

Thus, based on the research gaps identified above, this study has the following research objectives along with research questions.

With regard to the first research gap on conceptualising OI adoption as a form of management innovation and exploring how both research domains can be linked, this study proposes the following research objective:

1) **Research Objective 1**: To establish the research link between the concepts of open innovation and management innovation and to understand to what extent the open innovation practices can be considered and applied as a form of managerial practice.

Research Question 1: What is the conceptual relation between the open innovation paradigm and management innovation?

With regard to the second research gap on understanding how individuals adopt OI and MI, this study proposes the following research objective:

2) **Research Objective 2:** To present a systematic understanding of what factors impact the adoption of the open innovation practices as a form of management innovation at the individual-level of analysis.

Research Question 2: What factors impact the adoption of open innovation practices as a form of management innovation at the individual level of analysis?

With regard to the third research gap on understanding how individuals who are engaged in the adoption of open innovation practices as a form of management innovation experience it and how it impacts them, the following research objective is proposed:

3) **Research Objective 3:** To analyse the individual level outcomes associated with the post-adoption impact of the open innovation practices as a form of management innovation.

Research Question 3: How do the adopted open innovation practices as management innovation impact individuals' well-being and transform their jobs?

1. 3 SIGNIFICANCE OF THE STUDY

In order to answer the research questions and objectives outlined above, this study adopts a qualitative research design that will make it possible to explore the topic of study in great detail. The primary data collection method is semi-structured interviews. In total 22 interviews were collected from the participants, representing some traditional and some newly emerging industries, e.g., PropTech, Education, Advertising and Marketing, RegTech and others. The participants selected for this study come from different regions, e.g., Hong Kong, United Kingdom, Japan, Singapore etc. The data analysis was conducted in a three-step analytical procedure as suggested by Miles and Huberman (1994). In addition to that, this study also applied a text-mining analysis to the cleaned-up transcripts to supplement the findings obtained from the previous step as well as to discover new knowledge that might not be visible to a researcher.

Based on the findings obtained from the two types of analysis, we believe that this study offers significant contributions to both theory and practice. As for the theoretical contributions, our study contributes to the research gaps outlined above in the following ways.

With the regard to the 1st research gap on addressing the link between OI and MI as per Damanpour et al. (2018), Mol and Birkinshaw (2014), Simao et al. (2020), our study is one of the first that directly and empirically integrates the concepts of open innovation and management innovation in one context. By doing so, this study offers an original evidence that the process of opening up through application of and participation in open innovation practices is management innovation, and as such, open innovation can be examined from a perspective of changing managerial routines and organisational structures. Although there are some studies that link open innovation and management innovation (Mol and Birkinshaw, 2014) or suggest linking these two domains (Simao et al., 2020), our study offers a novel approach that integrates two research domains into one rather than investigating each of them separately. For example, unlike the study by Mol and Birkinshaw (2014), which analyses

only the application of external sources (inbound OI), our study also incorporates outbound OI activities. In other words, the results of our study demonstrate that open innovation activities share the same characteristics as management innovation. Thus, from this perspective, this study provides a novel and timely contribution to the recent work conducted by Simao et al. (2020), who suggest integrating the open innovation and management innovation research streams, leaving a promising avenue for further research.

With regard to the 2nd research gap on understanding the individual level perspective of OI and MI adoption as per Bogers et al. (2017), Khosravi et al. (2019), Simao et al. (2020), Volberda et al. (2014), our study reveals a number of previously unexplored micro-foundational factors that impact the adoption of the open innovation practices as management innovation. For example, we find that at the individual-level the self-directed learning and cosmopolitanism of individuals' impact on the adoption of the open innovation practices. In particular, our findings suggest that individuals with international experience/cosmopolitanism are more likely to adopt open innovation. To the best of our knowledge, the role of international experience has not been previously discussed by the OI scholars. From the one side, our study contributes to a growing body of literature that analyses open innovation micro foundations (e.g., Bogers et al., 2018b) by offering new factors. From the other side, our study presents a systematic adoption framework and reveals a number of new factors for the management innovation domain (e.g., extrinsic and intrinsic motivation), which is in line with the research call made by Khosravi et al. (2019). For example, our study demonstrates that from the individual-level perspective the smaller the organisation is, the easier is the adoption of open innovation practices as management innovation. This finding sheds light on the conflicting role of size in the management innovation literature, as identified by Khosravi et al. (2019).

Finally, with regard to the 3rd research gap on analysing the individual level outcomes associated with the adoption of open innovation as management innovation as suggested by Bogers et al. (2017), Khosravi et al. (2019) etc., our study suggests that the adoption of open innovation practices as management innovation makes employees feel more engaged, satisfied and productive with their jobs. Employees who feel more engaged at work are more satisfied with their lives and have better health (Lizano, 2021). Additionally, our study reveals that the adoption of open innovation as management innovation contributes to individuals' personal growth and allows them to obtain new skills and job specifications. From the one side, this study supports the previous findings of Alexy et al. (2013), who

document how the adoption of open-source software alters job structures. From the other side, our study provides an important contribution to the personal level outcomes, a topic that is largely absent both from the open innovation and management innovation research domains (e.g., Lifshitz-Assaf, 2018; Khosravi et al., 2019), since the majority of studies in these domains are focused on organisational level outcomes. From this perspective, our findings offer an original perspective on how the application of open innovation can help organisations to address work-related stress, reduce employee turnover intentions and enhance the general well-being of workers.

As for practical contributions, the findings obtained demonstrate how regional policies impact the adoption of open innovation practices as management innovation in Europe and Asia. We believe that these findings will be of great importance to policymakers and company owners as it highlights how regional policies facilitate or impede the adoption of open innovation and especially, in data-driven businesses. Finally, since there has been an increased interest to study open innovation in Asia, our study offers valuable insights into the APAC region and onto open innovation dynamics in this region.

1. 4 STRUCTURE OF THE THESIS

This thesis is organised in the following way. Chapter 1 is an introductory chapter that provides an overview of the research along with the research gaps, objectives, methodology and significance of this study. Chapter 2 presents a detailed literature review around three areas: management innovation, open innovation and how these two concepts can be linked. Chapter 3 focuses on the theoretical development of the research model, which is built upon the TOE framework, while chapter 4 is the methodology chapter, in which the research design selected for this study and the rationale behind it is explained. Then, chapter 5 reports on the findings obtained as a result of the 22 semi-structured interviews carried out. Chapter 6 provides a critical discussion on how the findings obtained compare against the existing literature, how these findings answer the research questions. Chapter 7 is the final chapter. It revisits the objectives and discusses the contributions of this study in more detail, along with the research's limitations and future work.

CHAPTER 2. LITERATURE REVIEW

2.1 INTRODUCTION

The objective of Chapter 2 of this thesis is to present a review of the published literature in relation to the topic of this study. Thus, this chapter will be structured in the following ways. Firstly, it provides a literature analysis of management innovation (MI) and the latest developments in this research domain. Secondly, it introduces a literature analysis of the open innovation (OI) research domain. The aim of presenting the two concepts separately is to show how both concepts have evolved and how the richness of OI can address the weakness of MI. Lastly, based on the research gaps identified in both research domains, this chapter proposes how to link the concept of OI and MI.

2.2 MANAGEMENT INNOVATION: DEFINITIONS AND CURRENT PERSPECTIVES

There are many types of innovation. For example, Schumpeter (1934),in his prominent work *Theory of Innovation,* identified five types of innovation, namely *new product, new process of production/business model, new markets, new sources of supply of produce*, and *new ways of organising business/ new organisational structures.* In spite of this, the vast majority of innovation research is focused on analysing innovations in the form of products or technology, i.e., a techno-centric approach (Crossan and Apaydin, 2010; Damanpour, 2014; Damanpour and Aravind, 2012; Henderson and Clark, 1990). For instance, based on a sample of 524 articles published between 1981 and 2008 in top innovation journals, Crossan and Apaydin (2010) discovered that only 3% were focused on non-technological forms of innovation. Similarly, another systematic review conducted by Keupp et al. (2012) demonstrated that, out of 342 articles published, 246 articles were focused on studying technological forms of innovation, whereas only 25 had a non-technological focus. Under technological forms Keup et al. (2012) included such types of innovation as product innovation, service innovation, process innovation, and creative destruction. Whereas for non-technological innovations, Keupp et al. (2012) considered such types as administrative

innovation, strategic reorientation, organisational change etc. So, what are these non-technological innovations, and why do they matter?

The notion of non-technological forms of innovation has long been acknowledged by scholars. For example, according to Damanpour (1991), innovation is defined as: "*adoption of an internally generated or purchased device, system, policy, program, process, product, or service that is new to the adopting organisation*" (p.556). In this definition the author not only includes products or devices (technological innovation), but also highlights the role of systems, policies and programs. The non-technological side of innovation is also well reflected in the fourth edition of the Oslo Manual (2018), which describes innovation as: "*a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)*" (p.20). This definition provided by the Oslo Manual distinguishes between two groups of innovation- *product* and *business process innovation/organisational innovation* (in the third edition of the Oslo Manual published in 2005 this type of innovation is defined as organisational innovation, which is very closely related to management innovation), i.e., technological and non-technological innovations. According to Damanpour and Aravind (2012), organisations no longer can or should focus only on introducing one type of innovation, rather they need to think of strategies that consider the implementation of both technological and non-technological forms of innovation simultaneously. These non-technological forms of innovation are also known as management innovation and they are considered to be one of the key factors for long-term competitive advantage (Hamel, 2006; Lin et al., 2016; Mol and Birkinshaw, 2009), and they demonstrate a positive effect on firm performance (Baird et al., 2019; Walker et al., 2011). In addition, some research suggests that for successful implementation of technological innovations companies need to introduce changes in their managerial practices, processes and structures, i.e., management innovation as a pre-condition for successful technology adoption (Damanpour, 2014; Damanpour and Aravind 2012; Heij et al., 2020; Hervas-Oliver et al., 2018; Mol and Birkinshaw, 2009; Hollen et al., 2013). Evidently, management innovation is an important topic within innovation research, but the existing literature demonstrates that this research area is still a very poorly understood one and unlike other innovation domains there are still many research gaps and only few empirical studies to date (Crossan and Apaydin, 2010; Khosravi et al., 2019; Simao et al., 2020; Volberda et al., 2014).

2.2.1 MANAGEMENT INNOVATION AND ITS PERSPECTIVES

The idea of management innovation is not entirely new and has long attracted scholars who wanted to distinguish it from technological forms of innovation, e.g., *administrative innovation* (Daft, 1978; Damanpour and Evan, 1984; Kimberly and Evanisko 1981) *or social innovation* (Damanpour et al., 1989; Trist and Murray 1993); *managerial innovation* (Damanpour and Aravind, 2012; Hwang, 2004); *organisational innovation* (Alänge et al., 1998; Battisti and Stoneman, 2010; Manual Oslo/ OECD, 2005). Although the aforementioned works provide important insights for the research, they present only a narrow understanding of what management innovation is. For example, according to Birkinshaw et al. (2008), *administrative innovation* represents a limited variety of innovation within organisational structure, such as HR policies, and does not include innovations observed in operations or marketing, i.e., strategies that are not targeting technical innovation (Damanpour and Evan, 1984). From the other side, *organisational innovation* can be used in conjunction with any type of innovation produced by companies, e.g., new products (Birkinshaw et al., 2008; Damanpour, 1991). Therefore, in order to avoid overlaps with these and other terms, researchers have long proposed using the term *management innovation* (Birkinshaw et al., 2008; Hamel, 2006; Kimberly, 1981).

Kimberly (1981) was one of the first authors to recognise the concept of MI, and defined it as: "*Any program, product or technique which represents a significant departure from the state of the art of management at the time it first appears, and which affects the nature, location, quality, or quantity of information that is available in the decision-making process*" (p.86). The central idea of this work is built on the notion "*what managers are and do*", where managers are considered to be decision-makers, and an application of management innovations is seen as a way of altering the decision-making processes. In 2006, in an article for Harvard Business Review, Hamel (2006) revived the notion of MI, by identifying it as: "*as a marked departure from traditional management principles, processes, and practices or a departure from customary organizational forms that significantly alters the way the work of management is performed. Put simply, Management Innovation changes how managers do what they do"* (p.71). However, it was not until 2008, when Birkinshaw, Hamel and Mol published their seminal work, that a new wave of interest towards MIs was generated.

Based on the synthesis of the literature at the time, Birkinshaw et al. (2008) established the following four perspectives that explain and demonstrate how management innovations can emerge and spread. These perspectives are as follows:

1) Institutional- this perspective is based at the macro level of a firm plus industry or country and seeks to understand under what institutional and socioeconomic circumstances management innovation occurs and spreads. For instance, Guillen (1994) analysed the role of seven sets of institutional factors on the implementation of new management beliefs and methods in four different countries. This perspective does not consider the role of human agency in facilitating the adoption process; rather it analyses the prerequisites in which management innovation first occurs and the factors that motivate others to adopt these managerial practices. Based on the institutional perspective the adoption of MI has innovative changes in management ideology and practices. For example, a recent study by Qi et al. (2021) suggests that green management innovation emerges as a result of peers' imitation among Chinese organisations.

2) Fashion- this perspective embraces both the macro and micro levels of firms plus the market and seeks to understand how facets of the supply and demand for novel management ideas impact on their distribution. Advocates of the fashion perspective analyse how management innovations occur through the interactions between managers who utilise new management ideas and the "fashion setters" who introduce these ideas, but it does not consider the role of human agents. While this perspective explains how management fashions are formed, it offers little understanding of why certain managerial practices succeed or fail. Within this perspective management fashions can prevail as non-objective ideas or rhetoric, as well as certain practices or methods. According to the fashion perspective outcomes associated with the adoption of MI do not demonstrate long-term profits. For instance, a study by Ma et al. (2018) states that Chinese mining organisations adopt green management innovations as a management fashion.

3) Cultural – this perspective is placed at the meso level of the firm plus individuals and it analyses how management innovations impact on and get impacted by the organisational culture in which it is being introduced. In particular, it focuses on understanding how personal attitudes toward management innovation cooperate with the organisation-level implementation of the innovation. In contrast to the two other perspectives, this perspective seeks to explain how management innovations are adopted from the perspective of individuals who engage in the process, rather than those who put it forward. The cultural perspective does not entirely reject the changes that occur as a result of MI adoption, but it also considers other changes in organisations that can have a larger impact, which in turn can mitigate the outcomes associated with the adopted MI. An example of a study that utilises

this perspective is the one by Kraśnicka et al. (2018), who analyse the mediating effect of pro-innovation organisational culture on management innovation.

4) Rational- this perspective is based on the presupposition that management innovations are brought in by individuals to make their work more efficient and it focuses on the role of managers in promoting new practices. According to Volberda et al. (2014), this perspective is built upon principles of Abrahamson's (1991, p.590) "efficient-choice" view. It grasps the micro-macro levels of analysis by considering organisational and environmental contexts. For example, MI from this perspective has been analysed in a case study design (e.g., Chandler, 1962; Tichy 1974) as well as a large quantitative study (e.g., Damanpour, 1987; Kimberly and Evanisko, 1981). Unlike the other three perspectives, the rational perspective examines the role of both internal and external individuals as the main factor that facilitates the adoption and diffusion of management innovations. Based on the rational perspective the adoption of MI demonstrates innovative changes in the way management work is done, but its success is not guaranteed. According to management innovation scholars (e.g., Sturdy, 2004; Volberda et al., 2014; Wei et al., 2019), most of the research on management innovation has been analysed within the rational perspective. Studies that adopt this perspective include, but are not limited to, Birkinshaw et al. (2008), Damanpour and Aravind (2012), Hamel (2006), Mol and Birkinshaw (2009), Sturdy (2004), Vaccaro et al. (2012), Walker et al. (2015) and others.

2.2.2 MANAGEMENT INNOVATION: "NEW TO THE STATE OF THE ART" VS "NEW TO THE ORGANISATION"

Following this categorisation of the MI perspective, Birkinshaw et al (2008) then propose the following operational definition for management innovation, which is: *"the generation and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals."* (Birkinshaw et al., 2008, p.829). According to the authors, any operational definition of management innovation should address the following issues. Firstly, *what is being innovated?* In regard to this question, the authors identify two levels*: an abstract level with management ideas and an operational level with management practices, processes, techniques, structures.* Secondly, *how new is the innovation*? According to the authors there are two aspects that offer answers to this question: "*new to the state of the art*" (Abrahamson, 1996; Kimberly and Evanisko, 1981) and "*new to the organization*" (McCabe, 2002; Zbaracki, 1998). Thirdly, *what is the purpose of implementing management innovation?* Regarding this question the authors refer

to the *fashion* and *cultural* perspectives, which consider management innovation to have a short-lived impact, and the *institutional* and *rational* perspectives, which consider management innovation to have positive outputs for the adopting organisation both from the traditional side (e.g., financial performance) and the softer side (e.g., employee well-being), and it can have societal impacts (Birkinshaw et al., 2008).

Although Birkinshaw et al. (2008) recognise "*new to the organization",* they do not include this aspect in their final definition. As can be seen, the three definitions listed above by Kimberly (1981), Hamel (2006) and Birkinshaw et al. (2008) suggest that MI is radical and disruptive by nature, because it focuses on such aspects as "*new to the state of the art*" and "*departure from traditional management principles*". The adoption of these radical management innovations can have major outcomes in an organisation's management processes and systems, e.g., Toyota's Lean Manufacturing or total quality management (TQM) (Birkinshaw et al., 2008). However, according to Walker et al. (2011), not all management innovations are disruptive by nature, e.g., remuneration policy or objective settings (Vaccaro, 2010). Based on this point by Walker et al. (2011), the subsequent post 2008 research had to diverge from the original definition set by the previous authors. For example, Mol and Birkinshaw (2009) suggest distinguishing between the two types of management innovation. The first one, as already discussed, is "*new to the state of the art*" and is related to a practice or a structure without any known precedent. The second one is related to something that is new to the firm and is adopted from a different environment *(*Damanpour and Aravind, 2012; Su and Lin, 2010; Vaccaro et al. 2012*),* and is referred to as *"new to the firm"* as per Mol and Birkinshaw (2009). While the categorisation of these two types of management innovations is widely accepted by the research community, Volberda et al. (2014) also suggest a third type of management innovation, which the authors describe as *new to the organisation, implemented without adaptation.* According to Volberda et al. (2014), this type of management innovation requires the adoption of already existing practices by an organisation and thus it makes no contribution to changes made at the inter-organisational level.

With regard to the second type of MI, i.e., *"new to the firm",* Damanpour and Aravind (2012) defined it as: "*new approaches in knowledge for performing the work of management and new processes that produce changes in the organisation's strategy, structure, administrative procedures, and systems"* (Damanpour and Aravind 2012, p.429-432). Similarly, Hecker and Ganter (2013) adopt the same approach and refer to management innovation as an application

of management practices that are novel to an organisation and are designed to improve organisational performance. According to Lin and Su (2014), *"new to the firm"* types of management innovation are widely practised among Chinese firms and the rest of the world and are adopted with the purpose of using organisational resources more effectively, as well as promoting their goals with no pursuit of differentiation and with no patent protection (Teece, 1980). To support this further, Vaccaro et al. (2012) state that*: "in the case of 'new to the organization', the level of analysis is the firm" and "focusing on this level of analysis enables us to empirically test a series of hypotheses at the firm level of analysis and draw on a potentially much more sizable sample of management innovations"* (p.30). Thus, as the unit of analysis in this study is individuals who represent firms, and due to the time constraints of any PhD project, we adopt the "new to the firm" type of MI as suggested by Mol and Birkinshaw (2009), Damanpour and Aravind (2012) and other scholars, since this makes it possible to assess a "sizable sample of management innovations". In particular, this study closely follows the definition suggested by Damanpour and Aravind (2012), as the majority of the recent studies in the research area adopt this definition (e.g., Azar and Ciabuschi, 2017; Khosravi et al., 2019; Magnier-Watanabe and Benton, 2017)

To supplement the discussion above, Table 2.1 provides several known definitions of management innovations, some of which have been discussed here. The definitions listed in the Table 2.1 are grouped based on the type of management innovation, i.e., "new to the state of art" and "new to the firm". This is done to visually demonstrate the conceptual differences between these two types of management innovation. For example, the definition listed by Kimberly (1981) in Table 2.1 emphasises the significant departure from the previous management principles, whereas the definition by Damanpour and Aravind (2012) considers management innovation as new approaches rather than a complete abandonment of old approaches. It is important to note that Table 2.1 only lists definitions that only include management innovation rather than organisational or administrative innovations to avoid any further confusions and overlaps. Therefore, it excludes some well-known definitions, such as the ones provided by the OECD or Damanpour (1991).

Table. 2.1 Definitions of management innovation

Source	Definition	Type
Kimberly (1981, p.86)	*"Any program, product or technique which represents a significant departure from the state of the art of management at the time it first appears, and which affects the nature, location, quality, or quantity of information that is available in the decision-making process"*	New to the state of art
Hamel (2006, p.71)	*"As a marked departure from traditional management principles, processes, and practices or a departure from customary organizational forms that significantly alters the way the work of management is performed. Put simply, Management Innovation changes how managers do what they do"*	New to the state of art
Birkinshaw et al. (2008, p. 829)	*"The generation and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals."*	New to the state of art
Mol and Birkinshaw (2009, p.1270)	*"The introduction of management practices that are new to the firm with the intention to enhance firm performance"*	New to the firm
Damanpour and Aravind (2012, p.429-432)	*"New approaches in knowledge for performing the work of management and new processes that produce changes in the organisation's strategy, structure, administrative procedures, and systems"*	New to the firm
Lin and Su (2014, p. 86–87)	*"The introduction and implementation of an existing or mature management practice, process, structure, or technique that has been successfully implemented elsewhere, aiming to improve organizational performance and further organizational goals"*	New to the firm

2.2.3 CHARACTERISTICS OF MANAGEMENT INNOVATIONS: MI VS TECHNOLOGICAL INNOVATIONS, TYPOLOGIES AND MAIN DIMENSIONS OF MI

Because the notion of management innovation (MI) rose to prominence to challenge a techno-centric innovation approach, it is important to understand what differentiates MI from technological innovation. According to Birkinshaw et al. (2008), unlike technological innovations, management innovations are tacit by nature, and they are difficult if not impossible to protect by patent (Teece 1980, p.464), as well as "*difficult to observe, define and to identify system borders for*" (Alänge et al., 1998, p.8). These two characteristics of MI are what form their sustainable competitive advantage (Mol and Birkinshaw, 2008). Secondly, management innovation is considered to be less beneficial short-term, harder to measure, complex in nature, more abstract (Damanapour and Aravind, 2012) and in

comparison to technological or product innovations it cannot be codified (Yam et al., 2011). Furthermore, not all organisations have established grounds to hire employees with expertise in management innovation; rather, most of them hire researchers who have knowledge of, and skills in, technological innovation (Birkinshaw et al., 2008). Unlike technological innovations, the adoption of management innovation is usually accompanied with uncertainty, because it is easier to track the success or failure of a technology implementation rather than a practice's implementation (Birkinshaw et al., 2008). Damanpour and Aravind (2012) state that the uncertainties associated with the adoption of management innovation could be related to the fact that technological or product innovations are usually implemented with a specific goal and their implementation and impact are more observable.

2.2.3.1 Typologies: Damanpour and Aravind (2012) vs Gebauer et al. (2017)

In addition to the distinctions provided above, Damanpour and Aravind (2012) also suggest that while technological innovations can be grouped into *product* or *process* innovations, there is no known similar typology for management innovations. Therefore, Damanpour and Aravind (2012) suggest the following possible typology:

Strategy and Structure

According to Chandler (1962), an organisation that wants to achieve its goals needs to select a structure that is consistent with its strategy. While strategy relates to an organisation's long-term goals and allocation of resources to achieve these goals (Chandler, 1962), structure is about organisational form, in which the organisation organises its activities and achieves an adjustment between these activities (Mintzberg, 1989). A general assumption is that an alteration in structure results in an alteration in strategy (Chandler, 1962; Wischnevsky and Damanpour 2008). Damanpour and Aravind (2012) argue that the distinction by structure and strategy can improve the comprehension of how MI impacts on organisational behaviour and outcomes.

Innovations in Forms vs Innovations in Procedures

Based on the changes obtained from the adoption of management innovation, researchers have identified innovation in forms and in processes (Cole, 1968; Williamson, 1975). This is also referred to as '*structural*' (new positions or units) and '*system*' (new control and planning systems) innovations (Hoffman, 1999). Damanpour and Aravind (2012) suggest that from an economic perspective these two types of MI innovation can be seen as 'labour-saving' and 'capital-saving'; while 'labour-saving' innovation improves performance and

modifies organisational forms, 'capital-saving' minimises the amount of funds required in the process and shifts organisational procedures (Edquist et al., 2001; Nyholm, 1995).

IT and Administrative Dimensions

Another possible type of MI as suggested by Damanpour and Aravind (2012) is based on the degree to which IT is integrated in, or facilitates the adoption of, management innovation. For example, innovations in organisational procedures may rely more on information technologies than innovations in organisational form. Additionally, according to Damanpour and Aravind (2012) and Walker et al. (2011), a further distinction for this type of MI can be considered based on IT and non-IT elements of management innovations.

Innovation Radicalness

According to Damanpour and Aravind (2012), in every research study radicalness has been regarded as an essential feature of innovation upon which scholars have developed typologies. In technological and product innovation research, radical and incremental innovations are similar to the outcomes associated with the '*exploration*' and '*exploitation*' concepts (Damanpour and Aravind, 2012; Li et al., 2008). Therefore, in regard to management innovation, under this type of MI, the authors suggest distinguishing between '*exploration*' and '*exploitation*'; while the explorative type of MI needs an exploration for more rigorous learning to generate innovative management techniques and tools, exploitative MI uses available ideas to improve management processes and systems.

The typology provided by Damanpour and Aravind (2012), has been one of the first in the research domain. However, it provides only a conceptual understanding. Thus, through conducting a case study among six organisations Gebauer et al. (2017) empirically identified four types of management innovation and offered their own typology, which is as follows:

1) Efficiency-driven management innovation. According to Gebauer et al. (2017), this type of management innovation has occurred in 6 out of 18 management practices in their case studies. This type of management innovation emerges when an individual within the organisation detects inefficiencies in their daily routine. For this type of management innovation to happen, it is important to recognise that a change is needed. This type of management innovation does not happen mechanically as it is usually met with lots of fear and internal resistance among employees that needs to be overcome. Examples of efficiency-

driven management innovation include service design, self-organised logistic teams, decentralised decision making etc.

2) Externally-recommended management innovation. In the study by Gebauer et al. (2017), this type of management innovation was found in 7 out of 18 management practices. This type of management innovation comes from the parties that are external to an organisation who come to organisations with proposals. The main barrier to this type of management innovation is that these external parties do not possess enough knowledge of how organisations function from the inside. External parties also suggest implementing those types of management innovation that are often applied by others rather than those which are found to be beneficial. As a result, even if this type of practice is adopted it might still fail as it requires a lot of effort and strong external support. Examples of externally-recommended management innovation include the persona method, the Kanban system, engineering for cost reduction, franchise systems, private donations etc.

3) Problem-oriented management innovation. According to Gebauer et al. (2017), this type of management innovation occurred in 3 out of 18 management practices. A problem-oriented management innovation emerges as a measure for a specific problem. Unlike an efficiency-driven management innovation, this type of management innovation needs an invention and cannot be substituted with an already existing practice. The main challenge for this type of management innovation lies in the fact that organisations need to identify that they have a problem and in comparison to efficiency-driven management innovation, problems are less tangible and thus less detectable. Examples of problem-oriented management innovation are debt management, collaborative supplier innovation, and user-oriented design.

4) Opportunity- oriented management innovation. This last type of management innovation appeared in 2 out of 18 management practices. Unlike the previous types of management innovation, this type emerges through an exploration of new opportunities. The purpose of this type of management innovation is not to tackle a problem, but to generate new opportunities. This type of management innovation is created through a symbiosis between an external and internal parties. The main challenge for opportunity-driven management innovation is that since it is created by external parties, internal parties might find it difficult to assess the progress. Examples of opportunity-oriented management innovation are value-based selling and business-model thinking (Gebauer et al., 2017).

As can be seen from the two typologies examined above, while Damanpour and Aravind (2012) offer theoretical possibilities of what types of management innovation might exist based on the previous innovation research (e.g., Chandler, 1962, Mintzberg, 1979/1989), Gebauer et al. (2017) created a typology based on its real-life application and thoroughly documented the process of its creation.

What is management innovation and what is it not?

Whilst the distinctions between management and technological innovations are clear, it is also important to understand that not every change in managerial practice can be called management innovation. On this note, Hamel (2006) states the following: "*While operational innovation focuses on a company's business processes (procurement, logistics, customer support, and so on), management innovation targets a company's management processes"* (p.76). For example, according to Vaccaro (2010) downsizing can have an impact on a firm but cannot be considered as management innovation if managerial operations remain the same. Accordingly, research suggests that an actual management innovation should be able to demonstrate changes across the following dimensions that constitute it (Birkinshaw et al., 2008; Hamel, 2008; Volberda et al., 2014). Firstly, changes in *management processes*- this change describes the way managerial work is done and highlights the shift from traditional processes, i.e., what managers do as part of their daily routine. Secondly, changes in *management practices*- this change occurs in routines that transform ideas into actions. Thirdly, changes in *organisational structures*- describes the means in which responsibility is distributed. Finally, changes in *techniques*- describes changes that occur in *routines* that are used to complete a certain goal or task. In other words, management innovations are a process of producing and adopting innovations that are new to an organisation that will change *management processes*, *practices, structure*s and *techniques*, and these changes will impact overall innovation performance, improve productivity and contribute to competitiveness (Birkinshaw et al., 2008; Nieves and Segarra-Cipres, 2015; Volberda et al., 2014).

The following examples demonstrate some of the well-known applications of management innovations. One of the earliest and the most successful examples can be traced back to General Electrics (GE) and Procter and Gamble's (P&G). The former is well-known for developing Thomas Edison's industrial research laboratory, and as a result for the next 50 years it secured the highest number of patents in America, whereas the latter is famous for

pioneering a technique called “brand management” in the early 1930s. Other classic examples include, but are not limited to, Toyota and its lean production system, total quality management (TQM), GM and its M-form organisation structure, as well as Visa, DuPont, Whirlpool and more (Birkinshaw et al., 2008; Hamel, 2006). In the present day it is worth mentioning self-managed teams at Royal DSM in the Netherlands, non-hierarchical office settings at Vodafone UK, event-driven decision making budgeting at Statoil Norway (Heyden et al., 2018), the implementation of peer groups in BP (Ghoshal and Gratton, 2002) and others.

2.2.4 PROCESS OF MANAGEMENT INNOVATION AND THE ROLE OF CHANGE AGENTS

According to a systematic review by Khosravi et al. (2019), the adoption of management innovation is associated with the following outcomes: improved financial (e.g., Azar and Ciabuschi, 2017) and general performance (e.g., Ali et al., 2016), innovation outcomes, e.g., technological (e.g., Azar and Ciabuschi, 2017) or process innovation (Camisón and A. Villar-López, 2014), and capabilities outcomes, e.g. dynamic capabilities (e.g., Gebauer, 2011). However, research suggests that the adoption of MI practices is a very complex and still a poorly understood process in comparison to technological innovations (Damanpour and Aravind, 2012). So, what contributes to MI emergence and further diffusion?

Birkinshaw and Mol (2006) state that there are two key steps that facilitate the emergence of MI, namely *dissatisfaction with the status quo* and *inspiration from other sources*, followed then by *invention*, *internal* and *external validation.* While *dissatisfaction* addresses the challenges and problems within an organisation, *inspiration from other sources* provides solutions to tackle the organisational challenges. Through an application of the rational perspective Birkinshaw et al. (2008) proposed a more refined MI process that consists of the following four stages:

- *Motivation* (problem-driven search, combining the two key steps discussed earlier)- at this stage managers need to examine the environment in order to evaluate the need for innovation (Volberda et al., 2014);
- *Invention*- this stage consists of the creation of intra-organisational change through testing new practices brought in by internal or external human agents (Volberda et al., 2014) ;
- *Implementation*- this stage assesses whether the MI implemented facilitated change that contributes to retention in the next phase (Volberda et al., 2014);

- *Theorisation and labelling*- this last stage describes how both internal and external change agents seek to create legitimacy within and outside the organisational boundaries (Volberda et al., 2014). According to Volberda et al. (2014) this last stage ("*theorisation and labelling*") joins together the organisational, the inter-organisational, and the macro levels of analysis because the organisation's response to a perceived environmental change promotes the changes in management practices at the industry level. Thus, the more successful human agents in legitimizing the new management practices are, the higher the chances that they will make it through the succeeding selection and retention phases at the inter-organisational level of analysis. At this stage it is assumed that if the MI has been successfully retained, it may facilitate the extinction of old and archaic practices.

While the process outlined above by Birkinshaw et al. (2008) is based on the '*new to the state of the art*' aspect of MI, Damanpour and Aravind (2012) argue that this process could also be applicable to the *'new to the firm'* aspect of MI as well. For instance, at the *motivation* and *invention stages* a new management innovation can be developed at a management consulting company, then during the *implementation stage* this innovation can be tested in a few clients' companies, and then during the *theorizing and labelling stages* it can be merchandised to other organisations. Thus, in this case a management innovation can be created and tested in one company, and diffused in another- the diffusion process can be assisted by an agent, a consulting company, or a spin-off, e.g., Six Sigma, or GE (General Electric) work-out (Damanpor and Aravind, 2012).Each of these steps described above is strongly influenced by two types of sources (Birkinshaw et al., 2008; Mol and Birkinshaw, 2009; Vaccaro, 2010): *internal change agents* and *external change agents.* Based on a synthesis of existing literature Volberda et al. (2014) provide the following characteristics of internal change agents. Firstly, internal change agents are responsible for the *generation of management innovation.* At this stage internal change agents provide knowledge to the generation process and choose the best innovations; a lack of external experience of the internal agents is linked to the production of systemic and radical innovations. Secondly, the internal change agents need to facilitate the *adoption* and *adaptation of management innovation.* At this stage internal change agents need to minimise the tensions between standardisation and adaptability to promote the intra-organisational diffusion of innovations (Ansari et al., 2014); the higher the position of the internal change agent, the higher are the chances of management innovations being adopted (Peeters et al., 2014).

As for *external change agents* Volberda et al. (2014) suggest that they contribute new knowledge and another point of view, and they are associated with incremental and systemic innovations. In general, there are three types of external change agent, which are as follows. Firstly, there are *external agents* such as academics, independent consultants, or other external players that impact the adoption of management innovations. Secondly, there *is external knowledge sourcing*- the surveillance of associated practices in other companies and contexts that are moved into the focal company. Thirdly, there is *external experience*- the application of external knowledge acquired during some form of training or external learning by internal change agents (Mol and Birkinshaw, 2014). The importance of the external agents in MI research has been confirmed by two quantitative studies. Firstly, through the data obtained from the Europe-wide Community Innovation Survey (CIS3) a study by Mol and Birkinshaw (2009) demonstrates how external search positively impacts the adoption and further diffusion of MI. Secondly, a study by Ganter and Hecker (2013) applied the same method to a set of data on German CIS, and confirmed that external sources of knowledge play an important role in the adoption of management innovations.

2.2.5 CURRENT RESEARCH PROBLEMS IN MI

While the previous sections of this study covered management innovation along with its definitions, dimensions, and processes, this section will focus on the current research gaps in the area and their importance for the current research. Although the notion of management innovation has been around since the prominent works of Abrahamson (1991), Kimberly (1981) and Birkinshaw et al. (2008), and its importance in building organisations' competitive advantage goes beyond that of technological innovation (Damanpour and Aravind, 2012), an examination of the literature suggests that the research area has several major gaps. In general, the management innovation field is still quite poorly researched, with the majority of its research being very outdated, as shown in this chapter, e.g., most of its research was published decades ago. On this note, there have been a few research calls for more studies on MI, for example, a recent systematic review by Khosravi et al. (2019), as well as a bibliometric analysis by Simao et al. (2020) in addition to prior calls made by Volberda et al. (2014) and Damanpour and Aravind (2012). Whilst these studies vary in their methodologies and timelines, they have two points in common: a) a growing interest in MI; b) very fragmented and inconsistent research. With regard to the latter point, a good example might be the topic of MI adoption. Although, as demonstrated above, the adoption of MI is very well documented from a theoretical perspective, there is little empirical evidence on

what factors impact the adoption process. For example, Khosravi et al. (2019) demonstrate that organisational size has a conflicting role in the MI literature. From the one side, organisational size can act as an antecedent to MI (Damanpour and Schneider, 2006), and from the other side it can be a moderator (Černe et al., 2013). Similarly, there is no empirical research that investigates what innovation characteristics of MI impact its adoption (Khosravi et al., 2019). On this note, Simao et al. (2020) state that we can only assume that the innovation characteristics of MI impact the adoption in a similar vein to technological innovation. Overall, Khosravi (2019) states that although there are studies that investigate the antecedents of MI adoption they are rather studied in isolation and do not provide a holistic picture. Thus, the first research gap is to address the lack of studies that analyse the adoption of MI in a systematic manner.

With regard to the first research gap, the literature review on the management innovation domain has demonstrated that the area is still lagging behind, and as such, most of its knowledge is built upon traditional managerial practices such as TQM or Six Sigma (e.g., Birkinshaw and Mol, 2006), organisational innovation (Camisón and Villar-López, 2014 as appears in Khosravi, 2019) and some recent studies emerging on the topic of green innovation as management innovation (e.g., Qi et al., 2021). A study by Mol and Birkinshaw (2014) demonstrates that the vast majority of work is focused on such managerial practices as quality (Lillrank, 1995), ISO 9000 (Guler et al., 2002), and poison pills (Davis, 1991), and as such, not many studies are dedicated to modern day managerial practices (the exception is green innovation, as specified above). This could explain the inconsistent and fragmented knowledge on such factors as organisational size, as suggested by Khosravi et al. (2019). However, and especially nowadays, organisations that want to adopt new innovations, be it a technological or a non-technological one, can no longer solely rely on their internal resources. In other words, organisations need to open up towards external ideas and innovation if they want to stay competitive and relevant. The concept of openness was coined by Henry Chesbrough in 2003 in his book *"Open Innovation: The New Imperative for Creating and Profiting from Technology"*. The open innovation paradigm assumes that organisations that want to innovate can do so either through opening up their organisational boundaries to external knowledge (inbound), or transfer unused internal knowledge to external markets (outbound) (Chesbrough, 2003a). The open innovation paradigm consists of various practices from crowdsourcing to spinoffs (Stanko et al., 2017) and according to Černe et al. (2016) these open innovation activities have a non-technological aspect to them. In a

bibliometric analysis Černe et al. (2016) classify non-technological forms of innovation in different categories. On the one side the authors distinguish management innovation as one type. On the other side, they list marketing innovation, ancillary innovation, non-technological process innovation, strategic innovation, green innovations and open innovation as other forms of non-technological innovation. This categorisation suggests that organisations that want to adopt new managerial practices can do so through opening up their boundaries to the open innovation activities. In other words, can we consider the open innovation practices as management innovation? Additionally, the notion of openness in management innovation research was also brought up in a recent bibliometric analysis on management innovation by Simao et al. (2020), who suggest that for the adoption of management innovation organisational openness is important. Throughout the examination of the management innovation literature it can be seen how much emphasise is put upon the role of external and internal change agents. For example, a typology study cited earlier in this chapter describes how external and internal change agents generate management innovation and how its application depends on their inputs (Gebauer et al., 2017). This is in addition to two studies noted in the previous section on the role of external agents and external sources of knowledge and their impact on the adoption of management innovation (Ganter and Hecker, 2013; Mol and Birkinshaw, 2009). Not only do these two studies demonstrate the important role of openness for management innovation, but they also highlight the important role of individuals in management innovation processes. This leads to the following research gaps.

Secondly and according to Simao et al. (2020) and Volberda et al. (2014), the adoption of management innovation depends on the individuals who participate in the process. Although we are aware of the roles of internal and external change agents as suggested by Birkinshaw et al. (2008), very little is known about the individual level perspective, their motivations and other micro foundational factors. On this note, Volberda et al. (2014) state the following: *"to explain why and how organizations introduce management innovations, we must look at the individuals"* (p.1259). The systematic study by Khosravi et al. (2019) identified only four studies that investigate the role of the individual's characteristic and their impact on MI adoption. As such, more research is needed to understand the individual level characteristics and their impact on the adoption of MI, as identified by Khosravi et al. (2019) and Simao et al. (2020). Thus, the second research gap is to address the lack of studies that analyse the adoption of MI from an individual level perspective.

Since it has been established above that to adopt new managerial practices organisations nowadays need to open up their organisational boundaries, this raises an important question. In other words, how will internal change agents, who are tasked to drive management innovation experience openness to external sources or to external change agents? Although the management innovation literature highlights the point that management innovation is created in symbiosis between internal and external change agents (Gebauer et al., 2017), it does not examine the individual perspective on such kinds of openness. Scholars who study organisational openness, i.e., open innovation, suggest that openness to external sources is dependent on the personal attitudes of employees and employees are most likely to demonstrate the not-invented-here (NIH) and not-shared-here (NSH) syndromes that impede the adoption of the open innovation practices (de Araújo Burcharth et al., 2014). This suggests that openness to management innovation must be addressed from the individual-level perspective.

Lastly, whilst we know about the outcomes associated with the adoption of MI on the organisational level, as identified by Khosravi et al. (2019) and Volberda et al. (2014), there is no evidence on the individual level outcomes. This research gap contradicts the very nature of MI, which promotes changes in managerial structures, processes and systems and thus raises a question about how this transition affects individuals that participate in the process. Volberda et al. (2013) identify this as a soft outcome of MI adoption and suggest researching how MI increases engagement, how it generates happiness etc. Thus, the third research gap is to provide empirical evidence on how the adoption of management innovation impacts on individuals, be it a positive or a negative impact.

With regard to the last research gap and as has been discussed above, organisations adopt a new managerial practice through opening up. This implies that inside the organisation individuals will be the first ones to be affected and so will be their jobs. The open innovation literature suggests that after opening up, some individuals may question their place within the organisation (Lifshitz-Assaf, 2015), but the management innovation literature does not discuss these individual level outcomes. This raises the question in the case of when an organisation opens up to a new managerial practice, how does this impact on its employees?

While this section of the chapter has discussed the current research limitations of management innovation and demonstrated how organisations can adopt new managerial practices through opening up, it has also highlighted the need to introduce the concept of

openness and to what extent this can be related to management innovation. Therefore, the next section of this chapter will introduce the open innovation paradigm and its current research developments. In particular the following section will focus on how open innovation research has evolved from the organisational to the individual level.

2.3 OVERVIEW OF THE OPEN INNOVATION PARADIGM

Traditionally organisations used to keep all innovation activities within their organisational boundaries. Chesbrough (2003a) named this model the *closed innovation model* and documented the transition from the closed model to the open model in his book *"Open Innovation: The New Imperative for Creating and Profiting from Technology"*. According to Chesbrough (2003a, 2003b), the open innovation model emerged to address the challenges associated with the closed model, such as: a) the spillover effect, e.g., Xerox PARC and Apple's GUI and mouse (Viki, 2017); b) researchers' departure to other companies to apply their unused knowledge in other environments, e.g., start-ups; c) the emergency of distributed knowledge in the knowledge economy (Gann, 2005). Therefore, in order to respond to these challenges, large companies like P&G and HP among many others started shifting to an open innovation model that promoted the idea of distributed and accessible knowledge, i.e., organisations opened up their business models to access external knowledge and transfer unused knowledge externally. Table 2.2 lists the main differences between the closed and open innovation models as per Chesbrough (2003b).

Table 2.2. Closed vs Open (Source: Chesbrough 2003b)

Closed Innovation Principles	Open Innovation Principles
The smart people in our field work for us.	Not all the smart people work for us. We need to work with smart people inside and outside our company.
To profit from R&D, we must discover it, develop it, and ship it ourselves.	External R&D can create significant value; internal R&D is needed to claim some portion of that value.
If we discover it ourselves, we will get it to market first.	We don't have to originate the research to profit from it.
The company that gets an innovation to market first will win.	Building a better business model is better than getting to market first.
If we create the most and the best ideas in the industry, we will win.	If we make the best use of internal and external ideas, we will win.
We should control our IP, so that our competitors don't profit from our ideas	We should profit from others' use of our IP, and we should buy others' IP whenever it advances our own business model.

Chesbrough's open innovation paradigm has become an absolute imperative today and it is one of the most widely studied topics among strategic management scholars (Bogers et al. 2019). For example, the concept of open innovation has been the subject of numerous systematic reviews and bibliometric analyses (e.g., Gao et al., 2020; Randhawa et al., 2016; Stanko, 2017; West and Bogers, 2014), special issues (e.g., R&D Management (2016), California Management Review (2018), Research Policy (2014), Technovation (2011) etc.) conferences, e.g., the annual conference- The World Open Innovation Conference (WOIC) to name a few. Although Chesbrough's open innovation paradigm gained such popularity among researchers and practitioners, Chesbrough's notion was not the first one in this research domain. In fact, prior to 2003 there was already research published that recognised the value and importance of applying external knowledge to internal innovation process. For example, finding new external technology for internal R&D by Nelson and Winter (1982), two modes of R&D- one of which is inside and the other one is outside of the company as per Cohen and Levinthal (1990), four external sources of knowledge according to Urban and Von Hippel (1988), strategic alliances (Gulati, 1998), sponsoring universities' external research for internal R&D (Colyvas et al., 2002), intermediate markets (Arora et al., 2001) and others. So, why has Chesbrough's notion of the open innovation paradigm become so popular and

applicable? Huizingh (2011) distinguishes the following four reasons that could explain the popularity of Chesbrough's open innovation.

Firstly, Chesbrough provided a single definition for a collection of similar concepts. By granting it a name, the paradigm got an image, and subsequent research interest gave it a body. Open innovation turned into the umbrella term that embodies, unites, and consolidates a variety of already available concepts. Secondly, the paradigm originated at the same time that there was a growing interest from the research community in such topics as outsourcing, networks, main competences, partnerships, and the internet. Thirdly, Chesbrough's paradigm provides researchers with plenty of possibilities for development, e.g., consolidated theory, measurement techniques, and management toolboxes. This all contributed to a further popularisation of the paradigm. Fourthly, Chesbrough's open innovation is not built only on accessing external knowledge. Unlike other works in the area rather it promotes the idea that in order to be open organisations need to open their innovation processes in two directions, namely obtaining external knowledge (inbound OI) and exploiting internal knowledge (outbound OI), which will be discussed later in this section.

Since its publication in 2003 research on Chesbrough's open innovation has evolved and grown and as a result there have been quite a few attempts to redefine the concept. Table 2.3 documents some of the most well-known definitions of open innovation and its evolution.

Table 2.3. Open innovation and evolution of its definitions

Definition	Source	Key Attributes
"…a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance their technology."	Chesbrough (2003a, p. xxiv)	External and internal ideas; Internal and external paths to market.
"…the company needs to open up its solid boundaries to let valuable knowledge flow in from the outside in order to create opportunities for cooperative innovation processes with partners, customers and/or suppliers. It also includes the exploitation of ideas and IP in order to bring them to market faster than competitors can."	(Gassmann and Enkel 2004, p.2).	Open up; Let valuable knowledge flow; Cooperative innovation processes; Exploitation of ideas and IP.
"…as systematically encouraging and exploring a wide range of internal and external sources for innovation opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels".	West and Gallagher (2006, p.320)	Exploring internal and external sources; Exploration and exploitation.
"…refers to systematically relying on a firm's dynamic capabilities of internally and externally carrying out the major technology management tasks, i.e., technology acquisition and technology exploitation, along the innovation process."	Lichtenthaler (2008, p.148)	Technology acquisition; Technology exploitation.
"Open innovation is a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with each organization's business model."	Chesbrough and Bogers (2014, p. 17)	Distributed innovation process; Purposive management of knowledge flows; Pecuniary and non-pecuniary mechanisms.

As can be seen from Table 2.3 the central idea that unifies these definitions is built upon using internal and external ideas, knowledge flows or IP. In particular, scholars mostly use two terms: exploitation and exploration (Gassmann and Enkel, 2004; Lichtenthaler, 2008; West and Gallagher, 2006). However, there is no common understanding on the process

itself. For example, while Lichtenthaler (2008) and West and Gallagher (2006) refer to a systematic process, Chesbrough (2003a) and Gassmann and Enkel (2004) suggest that organisations should open up. Thus, in order to reflect the earlier definitions of open innovation and provide a consolidated one, Chesbrough and Bogers (2014) proposed the following definition, as can be seen from Table 2.3: *"Open innovation is a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with each organization's business model" (p.17).* This definition is considered to be universally accepted by the research community nowadays as it includes the different perspectives discussed previously. According to this definition, the innovation process is attributed to the creation and commercialisation of novel or refined products, processes or services, whereas the openness part is portrayed by the knowledge flows across organisational boundaries. These knowledge flows are also known as *inbound* and *outbound* OI and they represent an important part of the open innovation paradigm and its research. The next section of this chapter will take a closer look at these two types of open innovation activity.

2.3.1 TYPES OF OPEN INNOVATION: INBOUND, OUTBOUND AND COUPLED PRACTICES

The original OI paradigm is built upon managing two knowledge flows: *outside-in,* also known as *inbound;* and *inside-out,* also known as *outbound* (Chesbrough and Bogers, 2014). In addition to that, Gassmann and Enkel (2004) suggest considering a third type of open innovation, specifically *coupled open innovation,* which combines the application of inbound and outbound knowledge flows.

Inbound open innovation is a type of open innovation that involves the exploration and integration of externally acquired or sourced knowledge with internal organisational knowledge for further commercialisation of innovation, knowledge or ideas. A more formal definition is provided by Chesbrough and Crowther (2006), who defined inbound OI as: *"the practice of leveraging the discoveries of others: companies need not and indeed should not rely exclusively on their own R&D"* (p.229). Gassmann and Enkel (2004) analyse inbound open innovation as a business process and define it as "*outside-in*" open innovation. This term describes a process that captures how a firm invests in collaboration with suppliers, consumers and other external knowledge sources in order to grow the knowledge base of the company, enhance its internal R&D, and improve its innovative capabilities. Another interesting perspective on inbound open innovation is provided by Lichtenthaler and Ernst

(2009), who analyse inbound open innovation from a technology aggressiveness perspective, where inbound activity is defined as "*technology exploration"* and is considered to be a strategic approach to open innovation model.

Examples of inbound open innovation practices include, but are not limited to, *beta testing* (Dolan and Matthews, 1993), *contracting/outsourcing* (Swan and Allred, 2003*), crowdsourcing/ideation* (Gatzweiler et al., 2017), *innovation contests* (Poetz and Schreier, 2012), *open search* (Salter et al., 2015) and others. Stanko et al. (2017) suggest a further expansion of the open innovation research domain will facilitate the exploration of new and previously unknown forms of inbound open innovation, and as such, our knowledge should not be limited to the practices listed here.

Outbound open innovation is the type of open innovation that suggests: "…*rather than relying entirely on internal paths to market, companies can look for external organizations with business models that are better suited to commercialize a given technology",* Chesbrough and Crowther (2006, p.229). In other words, this type of OI allows organisations to use internally unutilised knowledge and products outside of their organisational boundaries for others to apply in their organisations and business models. As in the case of inbound open innovation, Gassmann and Enkel (2004) define the outbound activity as an "*inside-out*" open innovation process, which describes how a firm exploits the internal knowledge externally, whereas Lichtenthaler (2009) defines outbound open innovation as "*technology exploitation*", i.e., outside relocation of technology or invention towards open exploitation processes. Companies that engage in outbound open innovation activity are doing so because they want to deliver their products to the market more quickly rather than doing so through internal development.

Examples of outbound open innovation practices include, but are not limited to, *innovation providers* (Tranekjer and Knudsen, 2012), *spinoffs* (Burg et al., 2008), *external technology commercialisation* (Lichtenthaler, 2009) and others. Among the successful business cases of how outbound open innovation works in practice can be named such examples as: a) *Viagra*- initially created to monitor blood pressure, but successfully commercialised as a drug for sexual support; b) *Botox*- originally developed as a nerve toxin, but nowadays more successful as wrinkle prevention treatment (Gassmann and Enkel, 2004).

Coupled open innovation is the third type of open innovation, although not the focus of this study as it focuses on the original notion of the OI paradigm, which was proposed by Gassmann and Enkel (2004). This type of open innovation can be defined as a combination of inside-out and outside-in knowledge flows to develop and commercialise knowledge, where knowledge "give and take are crucial for success" (Enkel et al., 2009, p. 313). Organisations that engage in coupled open innovation activities benefit through co-development, which increases their profit from the focal company's internal R&D by strengthening their partners' capacities (Chesbrough and Schwartz, 2007). The coupled open innovation process can either involve a combination of any inbound or outbound innovation activities, or some specific practices, such as *joint ventures*, *ecosystems* and *platforms*, *consorti*a, *strategic alliances*, all comprising complementary partners (Chesbrough and Bogers, 2014; Enkel et al., 2009; Stanko et al., 2017).

While these open innovation activities are applied by scholars and practitioners to understand to what extent organisations or individuals are engaged in open innovation, there are also some other mechanisms that are used to describe openness. For example, external search breadth and depth, as suggested by Laursen and Salter (2006, 2014). On this note, external search breadth describes the number of external sources that an organisation has access to, whereas external search depth describes how deeply an organisation engages with external sources (Laursen and Salter, 2006). Similarly, Dahlander and Gann (2010) suggest measuring openness based on two dimensions: pecuniary and non-pecuniary. While pecuniary compromises the acquiring (inbound) and selling (outbound) of open innovation activities, non-pecuniary includes the sourcing (inbound) and revealing (outbound) of open innovation activities. Although scholars widely apply mechanisms of openness (e.g., Badir et al., 2019; Grimaldi et al., 2021) as per Laursen and Salter (2006) and Dahlander and Gann (2010), when studying the application of the open innovation paradigm, in this study we will focus only on inbound and outbound open innovation, because: a) these two types of open innovation activity vary in the number of practices they represent, and as such, provide a rich research context; b) the purpose of this study is to demonstrate how these practices can be applied as managerial practices rather than measure the degree of openness.

The next section of this chapter presents the possibilities of exploring open innovation at the different levels of analysis and discusses the latest research developments with regard to the organisational and intra-organisational levels.

2.3.2 OPEN INNOVATION RESEARCH ACROSS DIFFERENT LEVELS OF ANALYSIS: FROM THE ORGANISATIONAL LEVEL TO THE INDIVIDUAL LEVEL

Although open innovation research spans almost two decades, the majority of it has been predominantly firm-centric. For example, a review by Chesbrough and Bogers (2014) demonstrates that out of 20 of the most cited papers in the research domain, 16 are focused on analysing open innovation from the *firm perspective,* followed by 9 studies from the *network perspective,* with some studies adopting more than one level of analysis, i.e., multilevel. This review was not the first one to raise the issue. An earlier systematic study by Gianiodis et al. (2010) revealed the same pattern. The most recent bibliometric review on open innovation conducted by Gao et al. (2020) supports these earlier studies by stating that the majority of studies are still conducted from the perspective of the firm. Such a research discrepancy makes the research domain incoherent and incomplete (Bogers et al., 2017). Thus, in order to facilitate research across other levels, Chesbrough and Bogers (2014) distinguish between seven levels of analysis and their potential research objects. As can be seen from Table 2.4 the most basic level of analysis is intra-organisational, and it is focused on individuals that participate in open innovation activities, with the highest level of analysis being focused on societies and the roles of public policies in open innovation processes.

Table 2.4. Open innovation and levels of analysis (Source: Chesbrough and Bogers, 2014)

Level of Analysis	Possible Research Object
Intra-organizational	Individual; Group/Team; Project; Functional Area; Business Unit
Organizational	Firm; Other (non-firm) organization; strategy; business model
Inter-organizational	Alliance; network; ecosystem
Extra-organizational	External Stakeholders: individual; community, organization
Industry	Industry development; inter industry differences
Regional innovation systems	Local region; nation; supra-national institution
Society	Citizens; public policy

Taking into account the lack of research across other levels of analysis, there have been numerous calls to understand the application of open innovation beyond the organisational level of analysis (e.g., Bogers et al., 2017; Chesbrough and Bogers, 2014; Stanko et al., 2017; West et al., 2014) with a particular focus on the neglected role of the individual perspective,

i.e., the intra-organisational level of analysis (e.g., Ahn et al., 2017; Barrett et al., 2021; Bogers et al., 2018b). Thus, below we will examine how the open innovation research evolved from the organisational level to the individual level.

Organisational Level

At the organisational level, the adoption of OI practices and the outcomes associated with it are very well documented. This can be explained by the fact that originally the OI paradigm emerged as a phenomenon attributed to large and R&D intense companies such as IBM, Lucent, Intel, P&G, Dell and others (Chesbrough, 2003b; Frey et al. 2011), and later it spread to other industries and companies of different sizes and sectors, e.g., SMEs (e.g., Huber et al., 2020; Parida et al., 2012; Santoro et al., 2019; Van de Vrande et al., 2009), government sectors (e.g., Almirall et al., 2014; Lee et al., 2012; Lee et al., 2020), tourism (e.g., Egger et al., 2014; Iglesias-Sánchez et al., 2019) among many others. A review of the organisational level adoption of OI practices demonstrates that companies that adopt the paradigm are motivated by the benefits it brings, for example, the *inbound open innovation* and its positive impact on an organisation's performance both in terms of revenue generated and innovations produced (e.g., Moretti and Biancardi, 2020; Oltra et al., 2018; Parida et al., 2012; Sisodiya et al., 2013; Wang et al., 2015). Similarly, the adoption of *outbound open innovation practices* has an impact on organisational performance (e.g., Hung and Chou, 2013; Lichtenthaler 2009; Lichtenthaler, 2015; Oltra et al., 2018) through shortening time to market and contributing to the adoption of technologies impacting on industry demand (Dahlander and Gann, 2010). On this level of analysis, studies go beyond analysing the outcomes of the adoption and explore factors that facilitate or impede the adoption of open innovation in SMEs (e.g., Bigliardi and Galati, 2016; Sag et al., 2016; Spithoven et al., 2013), and in large organisations (e.g., Brunswicker and Chesbrough, 2018; Chesbrough and Brunswicker, 2014; Mortara and Minshall, 2011; Spithoven et al., 2013). Similarly, at the organisational level of analysis the antecedents to open innovation are also quite well established. For example, there are studies that analyse the role of absorptive capacity (e.g., Spithoven et al., 2010; Zobel, 2017), the role of innovation climate (e.g., Popa et al., 2017), organisational culture (e.g., Mazur and Zaborek, 2016; Naqshbandi et al., 2015; Szymańska, 2016), organisational modes (Bianchi et al., 2011), appropriation strategies (Freel and Robson, 2016) and many others.

Project Level

Studies that analyse the implementation of open innovation at the project level have just started to emerge. One of the first studies that placed OI at this level of analysis is the one conducted by Du et al. (2014), who analysed the link between inbound open innovation in the form of external partnerships and its impact on the financial performance of R&D projects. The study suggests that with the right project management in place these relationships can yield positive results, though open innovation practices require a different approach to management. In another study that analyses open innovation at the project-level by Salge et al. (2013) it was found that open innovation projects demonstrate managerial contingency in such a way that for a successful implementation of inbound practices at the project level the right leadership and supporting environment is needed. Similarly an empirical study by Kim et al. (2014) explores the antecedents of open innovation at the project level. This study reveals that project-level openness is contingent on such characteristics as team size, team task, technology and market uncertainties etc. According to Brunswicker et al. (2016), when it comes to managing innovation projects at the project-level the same organisation can apply various types of OI practices, e.g., alliances, innovation contests, crowdsourcing. A more recent study by Barrett et al. (2021) explores how managerial/CEO characteristics, such as functional background, prior industrial experience and others impact the adoption of the OI practices among SMEs. In this study the authors focus on inbound, outbound and coupled OI activities. While this previous study focuses on the micro foundations at the project-level, another recent study by Bagherzadeh et al. (2021) demonstrates how the complexity and uncertainty of open innovation projects impacts on the micro foundations of open innovation projects, namely the openness level, external partner choice, OI mechanism choice, collaboration process formalisation, internal firm practices. In this study the authors analyse open innovation in the form of openness breadth and openness depth rather than focusing on the open innovation practices. These and other studies suggest that the adoption of OI practices at the project level differs from the firm level, and that the knowledge obtained from the lower level of analysis can greatly contribute to understanding of the firm level (e.g., Chesbrough et al., 2014).

Individual Level

According to Bogers et al. (2017, p.13), *"the effectiveness of firms' OI strategies strongly depends on the individuals tasked to bring those strategies to fruition"*, yet the individual

level research on open innovation was not broadly addressed until very recently (e.g., Ahn et al., 2017; Badir et al., 2019; Bogers et al., 2018b; Salter et al., 2015). Salter et al. (2014) state that the lack of adequate research on the role of individuals and the challenges associated with this level explains why some companies fail to successfully adopt and implement open innovation practices. Accordingly, Zynga et al. (2018) suggest that organisations that want to adopt open innovation need to establish open innovation capabilities at the lowest level of the organisation, which is micro foundations. These micro foundations do not only consist of processes and structures, but also individuals and their roles. Whilst the previous discussions demonstrated that antecedents that lead to open innovation adoption at the project-level and the outcomes associated with OI adoption at the firm-level are quite well established, the same cannot be said for the individual level. Although there has been a surge of studies that analyse the "human side", as in the micro foundational antecedents of open innovation, it is not sufficient when comparing it to the firm-level (Bogers et al., 2017; Gao et al., 2020). For example, a study by Ahn et al. (2017) reveals that the CEO's positive attitude, patience and other characteristics play an important role in promoting various modes of open innovation. However, not all individuals in organisations are CEOs. On this note, a study by Bogers et al. (2018b) investigates employee diversity not only of CEOs, but also HR executives, and its impact on firm-level openness. Yet according to the authors their study operationalises diversity on the firm level rather than that of the individual.

These and other studies on the individual-level factors help us to understand to a certain extent what contributes to a successful implementation of open innovation from the individual perspective, but what about the individual-level outcomes associated with the adoption of open innovation? The empirical evidence that can answer this question is scant.

To date very little is known about how individuals that participate in open innovation experience it. For example, Alexy et al. (2013) claim that in large organisations the adoption of open-source software eventually leads to changes in employees' job roles. One of the very few studies that addresses individual level outcomes is the one conducted by Salter et al. (2014), who suggest that individuals who engage in external open innovation are faced with a number of challenges, such as disclosure of IP, which goes against organisational policies, a lack of managerial practices that can support individuals to succeed in their new open innovation roles, as well as short term careers emerging under open innovation. Similarly, a study by Lifshitz-Assaf (2018) documents how R&D professionals at NASA that engage in

crowdsourcing open innovation practice go through a multifaceted transformation. The author concludes that only those professionals who accepted their new roles under open innovation were able to benefit from engaging in open innovation and lead its successful implementation. On this note, Bogers et al. (2018a) state that not all individuals can benefit from open innovation rather the ones with the right skills, as otherwise participation in open innovation results in wasted potential. Lastly, one of the most recent studies to raise the question of open innovation outcomes was conducted by Badir et al. (2019). In this study the authors demonstrate the positive impact of openness, although it is measured in depth and breadth rather than inbound and outbound open innovation practices, on employees' innovative output. These studies show that the adoption of open innovation practices has a twofold impact on employees. From the one side, there are challenges related to job transformations that are inevitable; from the other side, individuals may experience a positive transformation under certain conditions, which, however, are not established. Altogether, this suggests the need for more empirical research on the individual-level adoption of open innovation and its impact on the very same individuals rather than the firm-level. In other words, do individuals feel satisfied with their jobs or do they experience fear due to unawareness of their roles and responsibilities as a result of OI adoption? How does the adoption of open innovation fit within the working routines of these individuals? What can be done from a managerial perspective to support the individuals in their new roles?

In order to answer these and other questions, this study argues that we need to move away from a technology/product perspective of open innovation research and focus on its managerial capacities. In other words, can open innovation practices be applied as managerial practices? The next section of this chapter will answer this question by showing the integration between the management innovation and open innovation literatures.

2.4 ESTABLISHING THE RESEARCH PERSPECTIVE BETWEEN OI AND MI

While the previous two sections of this chapter presented the MI and OI concepts separately, in this section we will first discuss various research possibilities on where both concepts overlap and, secondly, we will demonstrate how open innovation is management innovation based on a comparison of the conceptual characteristics of the two domains.

2.4.1 EXPLORING RESEARCH OPPORTUNITIES BETWEEN MANAGEMENT INNOVATION AND OPEN INNOVATION

Although the research on both management and open innovation spans almost two decades, OI since Chesbrough's publication in 2003 and MI since Birkinshaw's publication in 2008, it was not until recently that scholars started analysing open innovation and management innovation in the same context. Through a detailed examination of the literature, the following main observation was reached: *the research that links both domains is limited, yet it has been growing over the past few years.* A more detailed discussion is offered below in points a) and b) to support this statement.

a) There is little research that links the open innovation paradigm and management innovation.

Despite the popularity of the open innovation paradigm in innovation management literature, as demonstrated earlier in this study, the research that links OI and MI is limited. This argument can be supported by the findings obtained from the recent systematic review on management innovations conducted by Khosravi et al. (2019). This meta-analysis lists the most common theoretical perspectives to study the application of MI, and OI is absent from this list, while RBV and organisational learning theories are widely used. The existing literature suggests that this could be due to the following reasons.

Firstly, until very recently the open innovation paradigm was mostly studied as a technological or product innovation and was mainly seen as a phenomenon related to R&D-intense industries (Ayerbe et al., 2020; Chesbrough and Bogers 2014; Dahlander and Gann 2010; Gassmann et al., 2010; Mignon et al., 2020; Mol and Birkinshaw, 2014). In fact, the application of the OI paradigm has been investigated to demonstrate the importance of organisational openness towards external sources when it comes to the adoption or generation of technological/product innovations (Aloini et al. 2017; Chesbrough and Bogers, 2014; Dahlander and Gann, 2010; West et al. 2014). Secondly, the majority of studies that analyse management innovations focus on internal antecedents, rather than exploring the role of external actors (Bocquet and Dubouloz, 2020; Damanpour and Aravind, 2012), i.e., inbound open innovation practices. However, according to Mol and Birkinshaw (2014) there is no reason not to assume that the central principles of the OI paradigm (that is that companies need to use knowledge flows in both directions in order to be innovative) could not be equally applied to management innovation. Thirdly, some researchers (e.g., Černe et al., 2016) classify management and open innovation as two different types of non-technological

innovation. Hence, management innovation researchers are focused on investigating isolated and well-known cases of management innovation (Mol and Birkinshaw, 2014) rather than integrating it with different types of non-technological innovation.

A further investigation revealed that there has been, however, an increased interest in linking both domains recently. Based on this point, table 2.5 lists studies that either directly or non-directly analyse open innovation and management innovation together. Under 'directly' we list studies that only include the open innovation paradigm (e.g., Huang and Rice, 2012), and under 'non-directly' studies that describe behaviours resembling the open innovation activities (e.g., Yang et al., 2020). This leads to the following discussion as outlined in point b).

b) An increased interest in linking both concepts in recent years.

The studies listed in Table 2.5 show an increased interest in linking the concept of OI and MI, and in particular this trend can be observed in the last few years. In fact, the studies marked with an asterisk are a part of the special issue published in 2020 in the Journal of Innovation Economic and Management under Cairn.info. The main objective of this special issue was to bridge the gap and propose the possible relationships between the two research domains. According to Ayerbe et al. (2020) and Mignon et al. (2020) the research on both OI and MI could unfold in the following two directions.

Firstly, open innovation as an antecedent of managerial innovations. Ayerbe et al. (2020) suggest that the application of the OI paradigm can be used to understand the adoption and emergence of the management innovation practices, because, as already established, external stakeholders play an important role in the adoption of management innovations. Additionally, the authors point to empirical findings provided by other research that proposes how the OI paradigm can explain the adoption of MI (e.g., Damanpour et al., 2018; Huang and Rice, 2012; Ganter and Hecker, 2013; Mol and Birkinshaw, 2009; Mol and Birkinshaw, 2014), but research in this direction is limited (Ayerbe et al., 2020; Damanpour et al., 2018; Mignon et al. 2020). Secondly, there is the application of the MI lens to study organisational structures and dimensions that facilitate OI. Regarding this point current research suggests that there is very little understanding of how managerial factors and organisational structures support or hinder the adoption and diffusion of OI practices (Bogers et al., 2017; Mignon et al., 2020). In other words, organisations that want to adopt open innovation practices need to consider the proper organisational structures, which can be explained through the lens of MI (Nisar et al., 2016), but there is no existing research that explores this link (Ayerbe et al., 2020).

Aside from the studies that were published in the special issue under Cairn.info, another study worth discussing here is the one published by Yang et al. (2020) as listed in Table 2.5. This study analyses how an organisation's explorative and exploitative behaviours directly impacts management innovation. Although the authors do not directly analyse the open innovation paradigm, the exploratory and exploitative behaviours are very well studied in the OI literature as the first one represents the inbound open innovation activity, whereas the second one represents the outbound open innovation activity (e.g., Gassmann and Enkel, 2004; Huizingh, 2011; Keupp and Gassmann, 2009). As such, Yang et al. (2020) identify the integration of open and management innovation research perspectives as a future research direction.

Table 2.5. Studies that analyse MI and OI in the same context (Source: partially adopted from Ayerbe et al. (2020) and expanded by the author)

Source	Title	Link to OI (direct/non-direct)	Methodology
Mol and Birkinshaw (2009)	*The sources of management innovation: When firms introduce new management practices*	Non-direct. External search perspective in combination with internal contextual factors have a positive effect on the introduction of management practices.	Quantitative; The UK Community Innovation Survey (CIS)
Huang and Rice (2012)	*Openness in Product and Process Innovation*	Direct. External sources of knowledge and other forms of inbound OI (process outsourcing, external technology acquisition etc.) have a positive impact on the adoption of technological and non-technological innovations, i.e., product and process innovation.	Quantitative; Innovation in Australian Business Survey (IABS)
Ganter and Hecker (2013)	*Deciphering Antecedents of Organizational Innovation*	Non-direct. Analysis of external sources of knowledge and their impact on the adoption of management innovations	Quantitative; The German Community Innovation Survey (CIS IV)

Mol and Birkinshaw (2014)	*The Role of External Involvement in the Creation of Management Innovations*	Direct. Application of open innovation lens in the form of external involvement has a positive effect on both radical and systemic innovation.	Qualitative; Archival sources of data
Damanpour *et al.* (2018)	*Internal and External Sources and the Adoption of Innovations in Organizations*	Direct. Application of OI paradigm in the form of external sources such as service providers, consultants and others has a positive effect on MI adoption, while the combination of internal and external sources of knowledge has a negative effect.	Quantitative; International City/County Management Association's (ICMA's) and Alternative Service Delivery (ASD) surveys
Mazars-Chapelon et al. (2018)	*The generation of management innovation in microenterprises: absorptive capacity and entrepreneur-CPA relationship*	Non-direct. Through an analysis of the entrepreneur-CPA relationship this study investigates the management innovation process, and proposes that both the entrepreneur and the CPA can act as open innovators who can organise internal and external sources of knowledge	Qualitative; Case study.
Yang et al. (2020)	*The fit between market learning and organizational capabilities for management innovation*	Non-direct. This study shows how exploratory and exploitative marketing learning positively impacts management innovation.	Quantitative; Survey.
Ayerbe et al. (2020) *	*Management Innovation and Open Innovation: For And Towards Dialogue*	Direct. Through an analysis of existing literature the authors explore the link between OI and MI in order to address the gap between the two research fields.	Conceptual; Analysis of existing literature and future research directions
Bocquet and Dubouloz (2020) *	*Firm Openness and Managerial Innovation: Rebalancing Deliberate Actions*	Direct. Through utilising both rational and institutional perspectives this study shows that there a	Quantitative; French Organisational Change and

	and Institutional Pressures	certain threshold of openness can have a counterproductive effect on the adoption of MI.	Computerisation survey
Calamel and Chabault (2020) *	*The Role of Proximities in the Construction of Managerial Innovation in a Collaborative Context*	Direct. Through an application of the proximist approach this study analyses the dynamics of managerial innovation in a collaborative framework, and what factors promote collaborative open innovation.	Qualitative; Longitudinal Exploratory Design

Finally, in addition to the studies listed in Table 2.5 a more recent bibliometric analysis on the intellectual structure of management innovation by Simao et al. (2020) calls for a direct integration of the open innovation perspective into management innovation to explain the creation or adoption of management innovation. Thus, the possible integration between these two concepts will be demonstrated below.

2.4.2 CONCEPTUAL CHARACTERISTICS OF MANAGEMENT INNOVATION AND OPEN INNOVATION

While the previous section demonstrated possible research opportunities on how to link management innovation and open innovation, this section will focus on conceptually linking the two concepts. The purpose of this section is to establish an explicit link between the concept of MI and OI through demonstrating that both concepts share similarities, and as such, the OI practices can be perceived and applied as MI in order to investigate the individual level adoption and outcomes associated with it. According to Birkinshaw et al. (2005), Mol and Birkinshaw (2008), and Mol and Birkinshaw (2009) there are four characteristics that constitute MI: *1) MI must be implemented*; *2) MI must be new; 3) MI must bring change to the way managers do their work; 4) MI aims to further organizational goals.* Therefore, based on the comparative literature analysis of both concepts this study suggests that OI shares similar characteristics to MI in the following ways.

Implementation

According to Birkinshaw et al. (2005) MI includes *implementation*, which means that any new innovation that is being adopted needs to be implemented in an another organisational

setting, and that is what distinguishes a management idea from management innovation as the latter creates value (Davenport et al. 2003; Gruber and Niles, 1972 as appears in Birkinshaw et al. 2005). In other words, management innovation involves an application of an idea from another setting that is later transferred into innovative practice inside an organisation (Mol and Birkinsahw, 2009). In a similar vein, research on open innovation demonstrates a wide application of the paradigm across various organisational settings. For example, open innovation gained attention in 2003, and was first adopted by large and high-tech companies, but recent studies demonstrate that the OI concept is now widely practised among SMEs and non-tech industries as was established is section 2.2.3 of this chapter. This suggests that the OI application demonstrates a parallel with MI in the sense that companies that decide to implement OI practices first scan the environment for similar ideas before adopting the innovation.

Exhibits novelty

Birkinshaw et al. (2005) state that MI does not have to demonstrate novelty to the world, but it must involve a new conception for the organisation that is adopting it, i.e., new to the state of art vs new to the adopting organisation. However, this does not mean that any new innovation is considered as MI; rather, the innovation must involve a certain level of risk and justification for the adopting organisation (Birkinshaw et al., 2005). Similarly, the implementation of the OI paradigm is always associated with high risks and uncertainties. For example, an organisation that decides to adopt open innovation practices needs to justify the costs and risks associated with some OIP practices, e.g., loss of IP control and knowledge protection, because empirical evidence suggests that the risks outweigh potential quick wins (Brunswicker and Chesbrough, 2018). From this perspective OI practices can be considered as MI, because while they exhibit novelty to the adopting organisation, they also demonstrate a high level of risks associated with it.

Change the way management work is done

According to Birkinshaw et al. (2005) and Mol and Birkinshaw (2009), an application of MI has to alter the full range of management daily activities, such as practices, processes and structures rather than impacting managerial ideas or beliefs (Abrahamson, 1996; Barley and Kunda 1992; Kramer and Kramer 1975). Although the research on open innovation demonstrates a significant gap on how the OI practices impact individuals/managers, there is

some empirical evidence that can be used to support this characteristic of MI. For example, as already discussed in the previous section of this chapter, the adoption of open-source software transforms individuals' job roles (Alexy et al., 2013). In addition, the application of inbound open innovation in the form of innovation contests helps managers to select the best ideas (King and Lakhani, 2013) and innovate efficiently and more quickly (Vanhaverbeke, 2017). Altogether this suggests that the adoption of the open innovation can alter managers' daily work as they have more free time, their work becomes less repetitive and the managerial structures can change, which is in line with management innovation.

Intended to further organisational goals

While this last characteristic is rather obvious, it explains why organisations adopt practices that involve high risk (Birkinshaw et al., 2005). Additionally, Birkinshaw et al. (2005) state that, firstly, not all management innovations have to be successful, for example, Volvo and its discontinued cellular manufacturing; and, secondly, organisational goals are not limited to traditional metrics, but also include the enhanced performance of employees. With regard to enhancing organisational goals, there is a vast number of studies that investigate how the adoption of open innovation improves organisational performance across various dimensions. For example, the application of inbound practices has been found to impact on firms' both financial (e.g., Aschoff and Schmidt, 2008; Carlsson et al., 2011; Mazzola et al., 2012) and innovation performance (e.g., Laursen and Salter, 2006; Mazzola et al., 2012; Un et al., 2010) and the implementation of outbound practices also impacts traditional metrics (e.g., Mazzola et al., 2012). Table 2.6 lists the characteristics discussed above along with the relevant examples.

Table 2.6. Characteristics of MI and OI

Characteristics of MI	Implementation	Exhibits Novelty	Change the way management work is done	Intended to further organisational goals
Application to OI	Emerged as a phenomenon attributed to large and high-tech companies, but spread to other industries and companies.	OI practices involve a high level of risks for an adopting organisations as companies need to justify and explain opening up their business models and potentially have no control over IP or knowledge as a result of opening up.	Implementation of OI practices in some cases helps to address lack of resources and helps managers to innovate more quickly.	Application of OI practices is associated with enhanced financial and innovation performance.
Examples of OI studies	e.g., Chesbrough and Crowther (2006); Chiaroni et al. (2011); Hossain and Kauranen (2016)	e.g., Dahlander and Gann (2010); Drechsler and Natter (2012); Lichtenthaler (2015); Temel and Vanhaverbeke (2020)	e.g., Usman and Vanhaverbeke (2017);	e.g., Cheng and Huizingh (2014); Greco et al. (2015); Mazzola et al. (2016);

Based on the comparison made in Table 2.6 of the conceptual characteristics between management and open innovation, this study suggests that open innovation practices are management innovation. By applying this logic, this study presents novel insights and distinguishes itself from the studies outlined in Table 2.5 in the following ways:

a) The studies listed in Table 2.5 are classified based on whether they analyse open and management innovation directly or non-directly. Out of 10 studies listed only 5 analyse the application of open innovation in relation to management innovation directly. These are: Ayerbe et al. (2020), Bocquet and Dubouloz (2020), Calamel and Chabault (2020), Damanpour et al. (2018), Huang and Rice (2012). Among these five studies Bocquet and Dubouloz (2020), Damanpour et al. (2018), and Huang and Rice (2012) investigate the impact of external sources of knowledge and other forms of inbound open innovation on the implementation of management innovation. All three studies are quantitative by nature and utilise pre-existing surveys. Although these studies provide valuable insights and establish grounds for open innovation and management innovation, they analyse both concepts

separately, which is not the objective of this study. As for the remaining two studies, Ayerbe et al. (2020) and Calamel and Chabault (2020), the former one is rather conceptual, while the latter analyses how management innovation occurs in collaborative networks and how it impacts on open innovation. From this perspective, our study postulates that open innovation is management innovation, and as such, it suggests analysing both concepts as one rather than looking at each of them separately.

b) In addition to the five studies discussed in the previous point, the only other study from Table 2.5 that directly analyses open innovation and management innovation is the one by Mol and Birkinshaw (2014). This study shares some similarities with our study in that Mol and Birkinshaw (2014) consider external involvement in a form of external experience, external knowledge and involvement of external change agents of management innovation as inbound open innovation, and accordingly analyse its impact on the creation of management innovation. Mol and Birkinshaw (2014) then conceptualise how each of these forms corresponds with management innovation typology based on the radicalness of the innovation and its impact on the organisation. The study utilises historical archives of 23 innovations to demonstrate how each of these forms impacts on the generation of management, radical or systematic innovations and how it is applied to management innovation. Similarly to our study, this study applies the open innovation lens. However, unlike the study by Mol and Birkinshaw (2014) our study is built upon the notion that the open innovation practices share the same characteristics as management innovation. Our study is also inclusive of the outbound open innovation practices, where the study by Mol and Birkinshaw (2014) focuses only on the inbound open innovation. Finally, our study utilises interviews to collect data rather than using historical data to demonstrate how the open innovation practices can be applied as management innovation and how they impact on individuals.

2.4.3 RESEARCH GAPS AND OBJECTIVES

By joining these two streams of research together the richness of the open innovation research will help better understand the adoption of management innovation and, at the same time, the managerial nature of management innovation research will help focus on the individual level perspective and the individual level outcomes of open innovation. Thus, by applying this logic the following research gaps will be addressed:

1) Address the gap between OI and MI as per following suggestions (Simao et al., 2020; Damanpour et al., 2018; Mol and Birkinshaw, 2014).

Based on the analysis of the management innovation literature, it is noticeable that there has been some interest in linking management innovation and open innovation. This could be due to the fact that unlike management innovation, open innovation is one of the most popular topics in innovation literature and its strengths can help to address the weakness of management innovation. The previous studies in this field, however, analysed the impact of external knowledge sources (e.g., Damanpour et al., 2018) on the implementation of management innovation. A recent suggestion has been made by Simao et al. (2020) to expand the management innovation domain to open innovation. Taking this suggestion into consideration, our study extends previous knowledge and offers the novel perspective that the open innovation practices can be viewed as management innovation by integrating the two domains together rather than analysing each of them separately.

2) Understand the individual level perspective of OI as well as MI adoption per Bogers et al. (2017), Khosravi et al. (2019), Volberda et al. (2014).

As demonstrated earlier in this chapter, both domains demonstrate the lack of research that analyses the individual-level perspective. According to Salter et al. (2014), the absence of the individual level perspective in open innovation research may answer why some organisations fail to adopt open innovation. While the open innovation research demonstrates increasing scholarly attention to the micro-foundations of open innovation (e.g., Bogers et al. 2018b; Badir et al. 2019), the same cannot be said for management innovation literature. Based on the systematic review by Khosravi et al. (2019) it can be seen that the evidence present is outdated and limited to a very few studies. According to Volberda et al. (2014), more research is needed on the micro-foundations of management innovation in order to understand what motivates change agents to adopt management innovation and how it impacts their actions. Additionally, Simao et al. (2020) identify the individual-level perspective as an important research direction. Thus, from this perspective, this study will address the recent research calls on the micro-foundations of open innovation (Bogers et al., 2017) and management innovation (e.g., Simao et al., 2020).

3) Analyse the individual level outcomes associated with the adoption of open innovation as management innovation as suggested by Bogers et al. (2017) and Lifshitz-Assaf (2018) among many others.

While on the organisational level of analysis the adoption of open innovation is associated with enhanced financial and innovation performance, very little is yet known about the individual level outcomes with the exception of a few studies that deal with R&D professionals (e.g., Alexy et al., 2013; Lifshitz-Assaf 2018). As for management innovation, the systematic review by Khosravi et al. (2019) demonstrates that there are no studies that investigate the individual outcomes. Rather, most of the work in the area is focused on capabilities outcomes, innovation outcomes and performance outcomes. However, an understanding of the individual level outcomes is important since the adoption of management innovation impacts on managerial work routines and structures, and as such, might make employees less engaged and stressed in their jobs. Thus, from this perspective our study will extend the previous knowledge of open innovation and address the gap in the management innovation literature.

2.5 SUMMARY

This chapter has presented a detailed overview of the research developments in both management and open innovation and demonstrated how the two concepts can be linked together. The first section of this chapter provided a consolidated review on the field of management innovation by showing its poor development and discussing the research gaps present. The second section introduced the open innovation paradigm along with its evolution, practices and the latest research developments. The third section focused on establishing the research link between the two concepts through an analysis of the literature and it theoretically demonstrated how the open innovation practices can be viewed as management innovation.

The next chapter of this study will present a conceptual model based on the theoretical assumptions outlined in this chapter.

CHAPTER 3. RESEARCH MODEL DEVELOPMENT

3.1 INTRODUCTION

The objective of Chapter 3 is to propose a research model based on the literature discussion and existing theoretical knowledge about the Technological-Organisational-Environmental-Individual (TOEI) framework. Therefore, this chapter is structured in the following way. Firstly, it defines the unit of analysis, individuals in this study, from the adoption of innovation perspective. Secondly, it provides an overview of the framework that will be used as a theoretical basis for this study. Thirdly, it demonstrates the integration of the management innovation (MI) angle into TOEI, and as such, makes the TOEI framework more consistent and in line with the objectives of this study. Finally, it presents the research model proposed for this study. The research model is split into two stages. In the first part this study focuses on the pre-adoption process of OI practices as MI, whereas the second part aims to analyse the individual-level outcomes associated with the adoption of OI practices as MI, i.e., post adoption analysis.

3.2 ADOPTION AND INDIVIDUAL PERSPECTIVE

Innovation has long been considered a key source for competitive advantage and economic prosperity (Damanpour and Schneider, 2006) and has been called the driving force behind "creative destruction" (Schumpeter, 1942). Research suggests that under competitive pressure organisations are rushed into adopting new models and techniques that will enhance their innovation performance. Current literature distinguishes between 41 various definitions of innovation depending on the research context, types, and outcomes. Therefore, this study chooses the definition provided by Rogers (2003, p.12), who defined innovation as "*…an idea, practice, or project that is perceived as new by an individual or other unit of adoption*", because it suggests that innovation can have different forms and it can be adopted by

organisations, individuals and others, i.e., not focusing on the firm-level perspective. This definition is also in line with our understanding of management innovation as outlined in the previous chapters of this study since it highlights the non-technological aspects of innovation and perceives it as an idea or practice, i.e., the adoption of open innovation as a management practice.

According to OI scholars the successful implementation of open innovation activities is highly dependent on the individuals who are at the forefront of their implementation (Bogers et al. 2017; Salter et al. 2014). Thus, it is crucial to understand what factors facilitate or impede the adoption of OI from the individual level perspective. For example, from an organisational perspective the implementation of inbound open innovation practices (external collaboration, knowledge sourcing, acquisition etc.) is facilitated by such factors as cost reduction and access to an extensive pool of knowledge and skills (e.g., Chesbrough 2003a, 2003b; Mortara and Minshall, 2011). However, from an individual perspective the adoption of these practices is faced with challenges associated with the NIH (Not Invented Here) syndrome that could affect the adoption behaviours of individuals (de Araújo Burcharth et al., 2014) and facilitate professional identity crisis (Lifshitz-Assaf, 2018) etc. Similarly, a firm that decides to adopt outbound or inside-out open innovation practices is motivated by strategic and financial benefits (Chesbrough, 2003a, 2003b; Gassmann, 2006; Grindley and Teece, 1997), but from an individual level perspective the implementation of outbound OIP encounters the NSH (Not Shared Here) syndrome (de Araújo Burcharth et al., 2014). Additionally, Kratzer et al. (2017) suggest that in organisations where the open innovation practices have already been implemented the majority of employees demonstrate closed innovation behaviour, which impedes further diffusion of the OI practices. These and other examples suggest that in the majority of the cases OI scholars ignore the individual level perspective when adopting the OI paradigm, and as such, a better understanding of what factors drive the individual level adoption of the OI practices is needed (e.g., Bogers et al., 2017).

Taking the above into account, the application of the TOE framework allows a researcher to investigate an individual level adoption, because according to Awa et al. (2017), unlike other adoption models that have a technological determinism approach (e.g., TAM), TOE focuses on people and acknowledges that people are not a substitutable element. Therefore, the next section will provide an introduction to TOE research and justify its application within the context of this study.

3.3 THE TOE FRAMEWORK

Technology-Organisation-Environment (TOE) is a multi-perspective theoretical framework that was developed by DePietro et al. (1990). Although the authorship is quite often wrongly attributed to Tornatzky and Fleischer, it is important to know that the latter were the editors of the book called "*The Processes of Technological Innovation"*, in which TOE was proposed by Rocco DePietro, Edith Wiarda and Mitchell Fleischer in a separate chapter. According to Baker (2012), the TOE framework explains how a technological innovation, or any other type of innovation, is adopted within three contexts, namely *technological*, *organisational* and *environmental.* While the TOE framework is consistent with Rogers's influential theory of Diffusion of Innovation (DOI), it also proposes such an important element as the environment (Oliveira and Martins, 2010). According to Baker (2012), the TOE contexts are described in the following way. Firstly, the *technological context* refers to all the technologies/innovations that are applicable to the firm and their characteristics. This includes both internal technologies that have already been adopted by the firm, and external ones that exist in the market, but have not been adopted by the firm yet. These technological innovations are not limited to technologies but can also include practices and / or equipment (Starbuck 1976). The *organisational context* describes the resources and characteristics of the firm, such as size, scope, managerial structure, communication processes and others. Finally, *the environmental context* is related to the environment where a firm operates, e.g., the structure of the industry, availability or lack of technology providers, regulations and others. These three contexts play an important role in TOE development not only because they demonstrate how innovations are adopted and diffused under the influence of these contexts (De Pietro et al., 1990; Dedrick and West 2003), but also because they describe "*both constraints and opportunities for technological innovation*", Tornatzky and Fleischer (1990, p. 154).

Innovation research demonstrates that the TOE framework is a very popular research model to study the adoption and diffusion of innovations, and as such, it has a strong theoretical basis and empirical support. For example, the TOE framework has been applied to analyse the adoption of open systems (Chau and Tam, 1997); e-commerce (Liu 2008; Martins and Oliveira 2009); e-business (Lin and Lin 2008; Zhu et al., 2003; Zhu et al., 2006; Zhu and Kraemer 2005); cloud computing (Alshamaila et al., 2013; Hsu et al., 2014; Oliveira et al., 2014); knowledge management systems (KMS) (Lee et al., 2009); big data (Sun et al., 2018); open government data (OGD) for the public sector (Wang and Lo, 2016); open innovation in

the public sector (Zhang et al., 2017); service co-production (Tsou and Hsu, 2015), teleconsultation (Yan et al., 2013) and others.

Table 3.1 lists some of the studies that apply the TOE framework and is structured in four sections. The first section in Table 3.1 lists a few examples of some well-known TOE studies that are cited in the most of the works that apply the TOE framework. These studies are listed here to show the long-established application of TOE among scholars. The second section of Table 3.1 lists TOE studies that apply institutional theory as a part of their environmental context, which is in line with the context of this study, which aims to integrate TOE and MI (more on this in section 3.4). The third section of Table 3.1 lists TOE studies that investigate the adoption of non-technological forms of innovation, in particular green innovation, which resonates with this study. This demonstrates the versatility of the TOE framework. The last section, as can be seen from Table 3.1, includes the studies that apply TOE to studying the latest technological developments, such as blockchains, big data etc. This suggests the applicability and relevance of the TOE framework for emerging research areas.

Table 3.1. Examples of studies that apply the TOE framework

Study	Adopted Innovation	Technological Context	Organisational Context	Environmental Context
Well-known examples of TOE studies				
Chau and Tam (1997)	Open Systems	perceived benefits, perceived barriers, perceived importance of compliance with standards, interoperability, and interconnectivity	complexity of IT infrastructure, satisfaction with existing systems, formalization of system development and management	market uncertainty
Zhu et al. (2003)	E-business	technology competence	Firm scope, firm size	Consumer readiness, competitive pressure, lack of trading, partner readiness
Alshamaila et al. (2013)	Cloud Computing	relative advantage, uncertainty, compatibility,	size, top management support,	competitive pressure, industry, market

		complexity, trialability, geo-restriction	innovativeness, prior IT experience	scope, supplier efforts
TOE studies that apply institutional theory				
Gibbs and Kraemer (2004)	E-commerce	Technology resources	Perceived benefits, lack of organisational compatibility, financial resources, firm size	External Pressure, government promotion, legislation barriers
Soares-Aguiar and Palma-Dos-Reis (2008)	E-procurement Systems	Technology competence	Firm scope, firm size	Extent of adoption among competitors, trading partner readiness, perceived success of competitor adopters
Li (2008)	E-procurement	Relative advantage, complexity, compatibility	Financial slack, top management support, technological readiness	External pressure, External support
TOE studies with non-technological focus				
Hwang et al. (2016)	Green Supply Chain	Relative advantage, complexity, compatibility	Organisational Resources, Organisational Innovativeness, Internal Stakeholders	Government regulation, customer, Competitor, social community
Zhang et al. (2020)	Green Innovation	Relative advantage, technology compatibility	Innovation capability, environmental concern	Policy orientation, market orientation
Recent TOE studies with emerging technologies				
Sun et al. (2018)	Big Data	Relative advantage, cost of adoption,	HR, Management support,	Security, privacy and

		complexity, compatibility, trialability, observability	Technology resources, Technology readiness, Decision-making culture, Change efficiency, Business strategy orientation, IT Organization structure, Business Resources IS strategy orientation, Firm size, Appropriateness	ethical concerns in collecting data, Trading partner readiness Regulatory environment IS fashion Market turbulence Institutional based trust
Clohessy et al. (2019)	Blockchain	Perceived benefits, complexity, compatibility, data security, maturity, relative advantage, Disintermediation, Smart contract coding, Architecture, Permissions (public vs private)	Organisational readiness, Top management support, Organisational size, Business model readiness, Technology readiness, Innovativeness, Participation incentives, Blockchain knowledge	Regulatory environment, Market dynamics, Industry pressure, Government support, Business use cases, Trading partner support, Critical user mass
Yoon et al. (2020)	Smart Farms	Relative advantage, complexity, compatibility	Financial cost, lack of skills, human resources vulnerability	Competitive pressure, government support, digital environment change

Such versatile application of the TOE framework across various contexts can be explained in the following ways. Firstly, unlike other adoption models such as TAM, TPB, UTAUT and DOI, TOE has a larger explanatory power as it offers a multidimensional perspective on the adoption process (Khayer et al., 2020) rather than being techno-centric, e.g., TAM (Venkatesh et al., 2007). Secondly, the TOE framework allows integration with other theories

and models. For example, Thong (1999) applies CEO characteristics from the DOI theory into TOE to study the adoption of information systems in small businesses. Thirdly, the TOE framework is a very adaptable framework that allows a researcher to uncover factors that have not been analysed before (Baker, 2012). For example, in a now-classic study, Zhu et al. (2003) demonstrate how "technology readiness" has a critical impact on e-business adoption. In another example, through an application of the TOE framework, Alshamaila et al. (2013) identified *geo-restriction* as a unique factor for cloud computing adoption, which had not been discovered by earlier studies.

Thus, based on the discussion provided above, this study selects the TOE framework (the individual parts of the TOEI framework will be explained later in this chapter) to study the adoption of the open innovation practices as management innovation.

3.4 INTEGRATING MI AND TOE

As established in the previous section, one of the main advantages of the TOE framework is that it allows an integration with other models and theoretical perspectives. Therefore, this study suggests an integration of the management innovation (MI) angle into the TOE framework to make this study more context specific. To recap, according to Birkinshaw et al. (2008) there are four perspectives that contribute to the emergence of management innovations. These perspectives were discussed in detail in chapter 2 of this study. Below is a quick overview of them.

Institutional- is based at the macro level, i.e., firm plus industry or country, and looks at what institutional and socioeconomic factors facilitate the emergence and further diffusion of management innovations. Management innovations that are adopted from this perspective are supposed to alter management beliefs and practices.

Fashion- is based at both the macro and micro levels of the firm and the market. This perspective looks at how the interaction between managers, who apply new ideas, and the "fashion setters ", who introduce the management ideas, impact on the emergence and diffusion of MIs. Management innovations that occur as a result of the fashion perspective do not have long-term profits.

Cultural- is based at the meso level of the firm and individual and looks at how management innovations get adopted and diffused under culture of an organisation they are being introduced in. From the change perspective, the cultural perspective does not reject the

changes that occur as a result of MI adoption, but it also considers the bigger picture, e.g., other changes made in an organisation.

Rational- is based at the micro-macro levels and focuses on the role of both internal and external actors who bring management innovations with the objective of improving their work, i.e., the "efficient-choice" view (Abrahamson, 1991, p.590).

By looking at the descriptions of these perspectives it becomes clear that these perspectives correspond to each of the TOEI contexts and, in a few instances, they could fit into more than one of the TOEI contexts. For example, the rational perspective focuses on the micro level and the role of human agents and, hence, it can address the individual context of the TOEI model, whereas the cultural perspective looks at the meso-level and how organisational culture shapes the adoption of innovations, i.e., the organisational context of the TOEI. Further research also reveals that the application of the perspectives listed here is not entirely novel among TOE scholars. For instance, studies by Gibbs and Kraemer (2004), Li (2008) and Soares-Aguiar and Palma-Dos-Reis (2008) integrated the institutional theory with the TOE framework. Therefore, in order to integrate the factors from the MI perspective into the TOEI framework, this study:

1) Conducted an extensive analysis of the references that Birkinshaw et al. (2008) used in relation to each of the MI perspectives. For example, such classic management studies as Abrahamson (1996) and Management of Fashion or Guillen (1994) and his Models of Management: Work, Authority, and Organisation in the comparative perspective.

2) Analysed the studies obtained from the first step and derived the significant factors that impact on MI adoption based on each of the perspectives.

3) Mapped the derived factors to each of the TOEI contexts based on their relevance in the context of this study.

As a result of this action this study ensures the following. Firstly, an integration of the MI perspectives into the TOEI framework gives this study a unique angle rather than focusing on the general TOE literature. Secondly, rather than focusing on one theoretical perspective, this study focuses on multiple perspectives at the same time. Thirdly, by fitting the MI perspectives this study can reveal some previously unknown factors in relation to OI research.

Table 3.2 presents a final selection of the factors that have been chosen for this study. The factors that are marked with an * are the ones that represent the MI angle of the model. As can be seen from Table 3.2 the only TOEI context that does not have any assigned MI perspective is the technological context, because this context focuses on the innovation attributes of management innovations, and as such, it does not have an equivalent in the MI literature, as this study also wants to address the gap of innovation characteristics of MI as called for by Khosravi et al. (2019) and Simao et al (2020). In other words it was decided not to assign any other perspectives to this context to focus on the innovation attributes of MI. As for the organisational context, it was decided to assign the cultural context to it, because both contexts (perspectives) focus on interactions within the organisations that could potentially impact on the adoption. As can be seen from Table 3.2, the environmental context of the TOE framework has two perspectives assigned from the MI literature, i.e., fashion and institutional. While the institutional perspectives addresses the socioeconomic factors that impact on the diffusion of MI externally, the fashion perspective analyses how, under external influences, new managerial practices are diffused. Additionally, the inclusion of the institutional perspective under the environmental context is seen in other TOE studies, as demonstrated earlier in this chapter (see Table 3.1), e.g., Gibbs and Kraemer (2004). Thus, such an alignment of the environmental context with these two MI perspectives was found to be the most suitable one. Finally, the individual context of the TOE framework is matched with the rational perspective of MI, as can be seen from Table 3.2. Since within this context this study aims to understand the micro foundational factors that drive the adoption of OI as MI, the rational perspective and its factors are the best fit to explore how individuals drive the adoption of OI as MI. Overall, Table 3.2 has one or two factors from general TOEI research, and one or two factors from the MI perspectives for each of the contexts. Additionally, wherever possible we have tried to integrate the OI literature as well, as can be seen from Table 3.2, since the MI research is limited.

Table 3.2. Selection of adoption factors for TOEI-MI

TOEI Context	MI Perspective	Proposed Factors	Adopted from
Technological	N/A	Relative Advantage; Compatibility; Complexity; Triallability	TOE
Organisational	Cultural	Size; Top Management Support; Organisational Culture*	TOE, MI (Cultural Perspective), OI
Environmental	Fashion; Institutional	Industry; Fashion Setters*; Coercive*; Normative*; Mimetic*	TOE, MI (Fashion and Institutional Perspectives), OI
Individual	Rational	Manager's Tenure*; Cosmopolitanism*; SDL	MI (Rational Perspective)

The rationale behind the selection of these particular factors will be explained in the subsequent section.

3.4.1 TECHNOLOGICAL/INNOVATION CONTEXT

According to Teo et al. (2003), the technological context of the TOE framework addresses an innovation that an organisation wants to adopt. At the centre of this context are the technology/ innovation characteristics themselves and how they impact on the adoption decision (Chau and Tam, 1997). The technological context used by TOE is consistent with the one suggested by the Diffusion of Innovation Theory in such a way that both DOI and TOE share a similar set of factors attributed to this context. In the original Diffusion of Innovation Theory by Rogers (1983) it was suggested that within the technological context the following five factors impact on the adoption of innovation through minimising uncertainties associated with the adoption: 1) *relative advantage, 2) compatibility, 3) complexity, 4) triallability,* and *5) observability*. This study adopts four factors, namely *relative advantage, compatibility, complexity and triallability* since there is no supporting empirical data for observability in the context of this study. In general, the majority of the TOE scholars analyse only three of these factors, namely relative advantage, compatibility and complexity (e.g., Hwang et al., 2016; Wang et al., 2016; Yoon et al., 2020). This study

includes triallability, because according to Khosravi et al. (2019) the aforementioned innovation attributes of management innovations have not been extensively analysed.

Relative advantage

Relative advantage is considered to be a key determinant for the adoption of innovation, and according to the research when a new technology or innovation is believed to provide more benefits than its predecessor it has a higher probability of being adopted (e.g., Ghobakhloo et al., 2011; Premkumar and Roberts, 1999; Rogers, 2003; Thong, 1999). This dimension of the technological/innovation context can be measured not only in economic terms, but also in social terms, such as convenience, satisfaction, performance and others (Rogers, 2003). Additionally, Rogers (2003) emphasises that the benefits of an innovation that is being adopted are not necessarily "objective", rather they can be perceived as being important to a certain individual and should be enough to justify the adoption.

In a recent systematic review on the MI literature Khosravi et al. (2019) lists relative advantage as one of the innovation factors that impacts on the implementation of MIs. Accordingly, Schneider (2007) suggests that the relative advantage of new managerial innovation is positively related to its adoption. Similarly, the open innovation practices provide a variety of benefits to organisations adopting them in comparison to existing innovation models. For example, external knowledge acquisition (inbound OI) is related to improved innovation (Bjerke and Johansson 2015; Popa et al., 2017) and the financial performance (Ahn et al., 2013; Zhang et al., 2018) of the companies, whereas the application of the outbound open innovation practices provides faster time to markets, expanding the organisation's technological presence and others (Huizingh 2011; Nagaoka and Kwon, 2006). In general, the application of the open innovation paradigm helps companies to maintain their innovativeness and sustain their competitive advantage (Brunswicker and Van de Vrande, 2014) and some open innovation practices have been identified as an important strategic choice to address the resource and financial shortcomings found is SMEs (Usman et al., 2018). With this in mind, it is expected that individuals who realise the full potential of the open innovation practices should recognise the need to adopt them to reap the benefits. Thus, the following is suggested:

P1: There is a positive relationship between the relative advantage of the OI practices as MI and their adoption.

Compatibility

Compatibility is the extent to which an innovation is considered to be consistent with the existing organisational practices, needs, values and experiences. According to (Rogers, 2003; Wang et al., 2010) the higher the extent of compatibility, the higher are the chances of an innovation adoption happening. In IT research it has been suggested that when a company decides to adopt a new technology, it must ensure that the existing infrastructure is compatible with the technology that is being adopted (Shaharudin et al., 2012). In other words, a higher level of compatibility means that an adopting organisation will be less likely to apply changes to its infrastructure (Thong, 1999). In addition to its importance to the adoption process, compatibility has also been found to be one of the key indicators for the post-adoption use of an innovation (Zhu et al., 2006). A few recent studies that apply the TOE framework also highlight the role of compatibility. For example, Yoon et al. (2020) suggest that compatibility is regarded as the most important factor in the adoption of smart farms in Korea, whereas Hwang et al. (2016) state that in the case of green supply chain adoption compatibility impacts on its relative advantage.

According to Lin et al. (2016) companies that seek to change their management practices need to make sure that the new practices are compatible with existing organisational routines, i.e., compatibility is an important factor for management innovations. From this perspective, research on open innovation demonstrates that early adopters of the open innovation practices do not need to establish new techniques and processes. Rather they can add the OI practices to an existing organisational process (Chesbrough and Crowther, 2006). According to the study by Lichtenthaler (2011), companies that adopt open innovation practices, strategic alliances/inbound or technology licensing/outbound, can rely upon their existing organisational values to promote the diffusion of these practices. This suggests that the OIP practices have a compatible nature, and as such, an adopting organisation does not need to alter its existing infrastructure. Thus, the following is suggested

P2: There is a positive relationship between the compatibility of the OI practices as MI and their adoption.

Complexity

According to Liu et al. (2014), complexity describes whether an innovation can be easily diffused or not. The extant research defines complexity as the extent to which an innovation is difficult to understand and to use (Rogers, 2003; Sonnewald et al., 2001). In other words,

innovations that are easier to understand will be adopted faster than innovations that need an adopting party to acquire new skills and knowledge (Rogers, 2003). Complexity is an important innovation factor, because even if an innovation is considered to bring benefits to an adopting party a lack of sufficient knowledge and expertise will impede its further diffusion (Rowe et al., 2012). Thus, unlike the other dimensions of the technological/innovation context listed here, complexity is negatively associated with innovation adoption (e.g., Ramdani et al., 2009; Thong, 1999; Tiwana and Bush, 2007).

Implementation of new management innovations can be perceived as a complex process as it requires an alignment of both internal and external change agents that play a crucial role in bringing in the management innovation processes to an organisation (Birkinshaw et al., 2008). Accordingly, Salter et al. (2014) state that the implementation of the OIPs might face a number of challenges among individuals involved in the process. For example, employees who do not have the right understanding of how to engage in the inbound open innovation process perceive it as "second best" and as a result fail to unlock the full potential of the OI paradigm, although the case company had an established infrastructure to support the implementation of the OIPs (Salter et al., 2014). The survey conducted among large firms by Chesbrough and Brunswicker (2018) demonstrates that some companies abandon the open innovation practices due to "lack of management capabilities" and challenges in organising it. Altogether this indicates that open innovation practices are less likely to be adopted if they are too difficult to understand. Thus, the following is suggested:

P3: There is a negative relationship between the complexity of the OI practices as MI and their adoption.

Triallability

Triallability is the extent to which an innovation can be experimented with on a limited basis. According to Rogers (1995; 2003), the higher the degree of triallability of the innovation the higher are the chances of its adoption. Because the adoption process requires time and resources it is important for adopters to test innovations in advance. The triallability of an innovation plays an important role for early adopters, because they do not have a precedent to follow, whereas the late adopters can imitate the early adopters. Overall, the innovation adoption literature has conflicting opinions on the role of triallability. For example, Alshamaila et al. (2013) found a positive impact between triallability and cloud computing

adoption, whereas Hsu et al. (2014) did not find a significant impact of the triallability of e-business on its adoption.

Although the management innovation literature suggests that one of the most important characteristics of management innovations is its implementation, which means that before a management practice is popularised among masses it needs to be adopted by another organisation, i.e., early adopters (Birkinshaw et al., 2005), there is no empirical evidence on whether the triallability of MI has an impact on its adoption. When it comes to open innovation research, we know that there are many types of open innovation practices, such as crowdsourcing, innovation contests, licensing (Stanko et al., 2017), open source and others. From this perspective, a study by Morgan and Finnegan (2010) found triallability to be a major factor that impacts on the adoption of Open Source, which the authors analyse as a subset of the open innovation paradigm. Thus, the following is suggested:

P4: There is a positive relationship between the triallability of OI practices as MI and their adoption.

3.4.2 ORGANISATIONAL CONTEXT AND CULTURAL PERSPECTIVE

According to Chau and Tam (1997) the organisational context examines the structures and procedures of a company that either impede or facilitate the adoption of innovations. The organisational context of the TOE framework very well corresponds to the cultural perspective of MI. According to the cultural perspective the diffusion of management innovations inside an organisation happens under the impact of organisational culture. This perspective is focused on the meso level of analysis. The final outcome of management innovations that are introduced within this perspective might differ from the initial purpose. Thus, to analyse the organisational context and cultural perspective the following factors were selected. Firstly, the size and top management support as they are represented in most of the TOE studies. Secondly, organisational culture, which represents the cultural perspective of MI.

Size

The TOE research demonstrates that organisational size is one of the most analysed factors that is used to study the adoption of innovations (e.g., Oliveira and Martins, 2009; Pan and Jang, 2008; Rogers, 2003; Thong, 1999; Zhu et al., 2003) due to the following reasons. Firstly, size is a convenient variable that is easy to measure and it provides a greater extent of accuracy. Secondly, size is a substitute measure that includes quite a few dimensions that

contribute to the adoption of innovations, such as the number of total resources, slack resources, organisational structure and others (Rogers, 2003). Despite this TOE and DOI scholars still have conflicting opinions on which way size exactly impacts on the adoption process, if it does (Baker, 2012; Lee and Xia, 2006).

In the MI literature size is one of the key organisational factors that impacts on the adoption of new management practices, and it can have either direct or moderating effects (Khosravi et al., 2019; Mol and Birkinshaw,2009). For example, Damanpour and Schneider (2006) and Ganter and Hecker (2013) find a positive correlation between the size of an organisation and the implementation of new management practices. It is assumed that larger organisations have more resources, such as complex ICT infrastructure and skilled workers that are needed for the adoption of new management practices. Yet, the role of size in MI is not entirely understood (Khosravi et al., 2019).

In a similar vein, in the open innovation research size was established as the most studied organisational factor that impacts on the paradigm's adoption (Bigliardi and Galati, 2016; Huizingh, 2011; Schroll and Mild, 2012; van der Meer 2007). Although the open innovation paradigm originated as a phenomenon attributed to large and multinational companies (e.g., Spithoven et al. 2013; Usman et al. 2018), there has been increased interest in analysing the OI adoption in SMEs as well (e.g., Brunswicker and Van de Vrande 2014; D'Angelo and Baroncelli, 2020; Usman et al., 2018). As a result, the correlation between size and the implementation of the OI paradigm remains debatable (e.g., Lee et al., 2010; Podmetina et al., 2011). Therefore, because the research on size in the OI literature remains inconclusive, the following is suggested from the perspective of MI:

P5: There is a positive relationship between the size of an organisation and the adoption of the OI practices as MI.

Top Management Support

TOE scholars found top management support to be a significant factor that impacts on the adoption process within an organisational context (e.g., Alshamaila et al., 2013; Ghobakhloo et al., 2011). According to Tushman and Nadler (1986), top management can facilitate the adoption of new innovations by creating an organisational environment that supports change and defines a firm's strategy and vision. In the management innovation literature, the role of top management has been discussed by a few scholars, e.g., Montes et al. (2005), Ravichandran and Rai (2000), Santos-Vijande and Álvarez-González, (2007). The research

suggests that managers that are involved with the implementation of the MIs need to carry out multiple responsibilities, i.e., the role of top managers is important (Khosravi et al., 2019; Montes et al., 2005). Likewise, the open innovation research states that a firm's decision to adopt open innovation practices is strongly associated with top management support (e.g., Chesbrough and Brunswicker, 2013). Thus, the following is suggested:

P6: There is a positive relationship between the top management support and the adoption of the OI practices as MI.

Organisational Culture

According to Yeung et al. (1991) organisational culture reflects the already established cultural beliefs and experiences of an organisation. The cultural perspective of the MI postulates that organisations that adopt management innovations do not change and the outcome of its adoption usually differs from the initial purpose, which means that a new managerial innovation must be compatible with an organisational culture (i.e., compatibility as per TOE) in such a way that it is organisational culture that shapes a new innovation. Within the management innovation literature, the role of culture has been researched in the following ways. Firstly, two studies analysed the mediating role of an organisation culture on MI (Ali and Park, 2016; Krasnicka et al., 2018). Secondly, a recent study by Janka et al. (2020) focuses on stability values and the way they shapes managerial innovations. Lastly, a configurational analysis demonstrates how the organisational culture compensates for the effects of national cultures when it comes to TQM implementation (Alofan et al., 2020).

The extant research on the implementation of the open innovation practices considers the organisational culture to be a critical driver. For example, Naqshbandi et al. (2015) suggest that hierarchical culture impedes both the diffusion of inbound and outbound OI practices, whereas a study by Kratzer et al. (2017) analyses the role of internal openness on the assimilation of the open innovation practices in contrast to studies that focus on external openness. While these and other studies focus on the different types of culture that promote the adoption of the OI paradigm, this study takes a cultural perspective approach to MI and focuses on the role of individuals that have to participate in the adoption of the OI practices as MI, and suggests the following:

P7. Organisational culture facilitates the adoption of the OI practices as MI in such a way that the more open the key individuals are the more likely the OI practices are to be adopted.

3.4.3 ENVIRONMENTAL CONTEXT, FASHION AND INSTITUTIONAL PERSPECTIVES

Research suggests that the environmental characteristics of the TOE play one of the key roles in facilitating management innovations, because the main motivation to adopt new managerial practices comes from the external environment (Damanpour and Schneider, 2006). Within the MI context and according to Fichman (2004) both fashion and the institutional perspectives of MI share a common view that the adoption of MIs is not a rational choice, rather it is the impact of the external environment that forms these decisions. Following this assumption both fashion and institutional perspectives are chosen to analyse the environmental factors that facilitate the adoption of OI practices as MI in addition to the original environmental context of the TOE framework.

The fashion perspective of MI explains how management ideas occur and spread under external conditions, but unlike the environmental context of the TOE the fashion theory aims to understand why some management ideas stay and others just die off. This perspective analyses both the macro and micro levels of the external environment, as well as how managerial interactions shape the adoption processes. According to Abrahamson (1991), organisations that follow the fashion perspective, *i.e., management fashion followers*, do not choose what innovations to adopt, rather they focus on which organisation they should follow, *i.e., management fashion setters*. Organisational scholars that study the diffusion of innovation within this perspective suggest that management fashion followers choose to follow *fashion setters*, because unlike governmental structures or labour unions, the fashion setters do not demonstrate forced power (Abrahamson, 1996; Czarniawska-Joerges, 1988; DiMaggio and Powell, 1983).

The institutional perspective of MI is focused on the socioeconomic structures under which the management innovations occur and spread. It focuses on the macro level of a firm plus industry or country (Birkinshaw et al., 2008). Within this perspective the adoption of management innovations is driven by normative beliefs about the notion of progress. However, they are also dependent on economic fluctuations, which can create performance gaps, which in turn leads to the emergence of new MIs (Abrahamson, 1997; Barley and Kunda, 1992- as appears in Birkinshaw et al., 2008). In general, the institutional perspective represents the institutional theory that explains the behaviours and actions of a firm and according to DiMaggio and Powell (1983) there are three institutional mechanisms that explain the institutional diffusion of innovations, namely mimetic, coercive, and normative pressures.

Based on the above, the following factors were chosen to investigate the environmental, fashion and institutional contexts of the TOE framework. Firstly, industry, which is the most common factor among the TOE scholars. Secondly, fashion setters, which represent the fashion perspective of MI as suggested by Abrahamson (1991; 1996). Thirdly, three mechanisms of the institutional perspective as suggested by DiMaggio and Powell (1983): mimetic, normative and coercive pressures.

Industry

The TOE research demonstrates that industry is one of the most widely studied factors that researchers use to analyse the adoption of innovations (e.g., Alshamaila et al., 2013; Kuan and Chau, 2001; Ramdani et al., 2009). While there is no clear link between the industry an organisation operates in and the adoption of management innovations (this could be due to the limited empirical research on MI), the extant research suggests that the adoption of management innovations is a very complex process and is quite specific to the organisation that is adopting it, because management innovations are tacit by nature and difficult to replicate (Černe et al., 2013; Volberda et al., 2013). Thus, management innovations are unique to the environmental context of the organisations that adopt them (Hecker and Ganter, 2013). This implies that the industry defines what type of practices will be adopted.

The open innovation practices were historically attributed to large and multinational technological companies (e.g., Chesbrough and Crowther, 2006), and only later did the phenomenon spread to other industries (Dahlander and Gann, 2010; Gassmann et al., 2010). According to Huizingh (2011), industry is the most explicit external factor that impacts on the adoption of open innovation practices and there are different adoption rates among various industries (Huizingh, 2011; Schroll and Mild 2012), and some industries will demonstrate a preference towards adopting either inbound or outbound OI. For example, the outbound open innovation practices can be attributed to industries where the regulation of IP rights is comparatively simple (Van de Vrande et al., 2009). Thus, the following is suggested:

P8: There is a positive relationship between the industry an organisation operates in and the adoption of the OI practices as MI.

Fashion setters

Fashion setters is one of the key components of management fashion theory as per Abrahamson (1991; 1996). According to Abrahamson (1996) management fashion setters can

be consulting firms, business mass-media publications, business schools, management gurus, certain professional societies and others. Management fashion setters are usually organisations that are outside of the adopting group that create and spread new management ideas that management followers accept or reject (Abrahamson, 1991; Hirsch, 1972). Fashion setters who do not create and disseminate new management ideas are considered to be laggards. Abrahamson (1996) states that there is a community of management fashion setters that shift collective beliefs on management ideas and impact on the adoption decision of management followers. Thus, management innovations do not emerge out of nowhere. Rather, they are products of fashion setters that put their ideas forward. Some of these created products can become mass products, while some can fail. The empirical evidence on the MI adoption and diffusion also supports this argument. For example, according to Madsen and Stenheim (2013) the popularisation of such management practices as Knowledge Management (e.g., Grant 2011), Talent Management (e.g., Iles et al., 2010), Quality Management (e.g., David and Strang, 2006) and others demonstrate the significance of the fashion-setting community.

In regard to the open innovation paradigm, literature demonstrates conflicting opinions on whether open innovation is adopted as management fashion or not. For example, Trott and Hartmann (2009) criticise the paradigm and call it 'the old wine in new bottles' that got popularised under Chesbrough's publication, whereas Lichtenthaler (2011) argues that open innovation is a sustainable development rather than a management fashion. Since this study considers the open innovation practices as management innovation, the following is suggested:

P9: The exposure to fashion setters (e.g., the presence of management gurus, consultants, conferences) will positively impact on the adoption of the OI practices as MI.

Institutional mechanisms: Coercive, normative and mimetic

While the innovation adoption literature that applies the TOE framework sees the adoption as a rational choice that is pursued by organisations to enhance their efficiency, the institutional theory stresses the significance of institutional mechanisms that impact on organisational decisions to adopt innovations (Scott 2001; Teo et al., 2003). The institutional perspective of MI suggests analysing the diffusion of new managerial practices on the macro level and focuses on the institutional mechanisms that facilitate or impede the adoption (Birkinshaw et al., 2008). According to DiMaggio and Powell (1983) there are three institutional

mechanisms. Firstly, a mimetic pressure that describes an institutional condition under which an organisation adopts an innovation because it wants to imitate their competitors in times of uncertainty. Secondly, a normative pressure that describes an institutional environment in which an organisation's adoption is driven by the norms and demands of their professional networks. Thirdly, a coercive pressure, which is an institutional mechanism that describes the pressure of external stakeholders, e.g., government and non-governmental regulations upon which an organisation depends and as a result it impacts on the adoption behaviour (DiMaggio and Powell, 1983; Powell and DiMaggio, 1991). The adoption of the OI paradigm can be also analysed through an institutional lens. For example, the application of the open innovation paradigm is no longer limited to organisations, but nowadays it is also applied by public organisations as well as at the national level (e.g., Freitas et al., 2013; Lee et al., 2020), which implies a possible effect of coercive pressure. From the other side, evidently, organisations that participate in open innovation activities join in forming ecosystems with the other organisations (e.g., Xie and Wang, 2021), which assumes that organisations will be exposed to a certain degree of normative pressure. As for the mimetic pressure, the open innovation research demonstrates that the implementation of the OI activities could be potentially linked to environmental uncertainties, which suggests that organisations adopting the OI paradigm are participating in imitating behaviour.

Thus, the following is suggested:

P10: The institutional mechanisms (mimetic, normative, and coercive pressure) impact on the adoption of the OI practices as MI.

3.4.4 INDIVIDUAL CONTEXT AND RATIONAL PERSPECTIVE: FROM TOE TO TOEI

In addition to the TOE-MI contexts discussed above, this study also suggests extending the TOE-MI framework to TOEI-MI by extracting the individual level factors into a separate context to enrich our understanding of the micro foundations that facilitate the adoption of the OI practices as MI. The TOE researchers have long acknowledged the need to investigate the individual level characteristics that impact on the innovation adoption processes to enhance further developments of TOE research (e.g., Awa et al., 2017; Baker, 2012; Premkumar, 2003). For example, the following TOE studies have already extended the original TOE framework to TOEI: cloud computing adoption (Khayer et al., 2020), CAATs (Rosli et al.,

2012), ICT platforms/ technology adoption (Awa et al., 2017), DRP (Hoong and Marthandan, 2014) and others.

In addition to extending the original TOE to TOEI, this study also suggests analysing the adoption of the OI practices as MI from the rational perspective of MI research. The rational perspective of MI is placed at the micro-macro level and is solely focused on the role of human agents in adopting and diffusing management innovations. Agents that bring management innovations do so with the aim of improving their managerial practices. Therefore, in the context of this study, the rational perspective is found to be relevant to the individual context of the TOEI framework as they both analyse the role of individuals and their personal characteristics that impact on the adoption of innovations.

Thus, the following three factors are selected to analyse this context of TOEI. Firstly, the manager's tenure, which has been adopted from the literature on the rational perspective of MI research. Secondly, cosmopolitanism/international experience, which also has been adopted from the literature on the rational perspective of MI research. Thirdly, self-directed learning, which has been adopted from the general MI literature. The theoretical rationale is provided below.

Manager's tenure

According to Khosravi et al. (2019), the manager's tenure is one of the micro level characteristics that impacts on the adoption of management innovations. The empirical data offers conflicting opinions on the link between the manager's tenure and the adoption of MIs. For example, according to some scholars, younger managers who have just started at their position are more welcoming towards innovation, because they bring a fresh outlook, whereas managers who have worked in organisations for a long time will be less open towards new ideas and changes by sticking to the old ways (Boeker, 1997; Hambrick and Mason, 1984). On the other hand, a study by Damanpour and Schneider (2006) suggests a positive correlation between all three phases of innovation adoption and the tenure of managers, whereas Young et al. (2001) did not find a significant effect of tenure on the implementation of TQM practices (management innovation) in public hospitals. Both studies propose that tenure is a context dependent variable. The manager's tenure is also an important rational perspective variable that was analysed in the work of Kimberly and Evanisko (1981) on the adoption of technological and administrative innovations in hospitals.

In the open innovation research not many studies have investigated the direct effect of tenure. Rather, most are focused on organisational age or the moderating effects of managers' experience (e.g., Badir et al., 2019). However, through an exploratory study it has been suggested that the average tenure of an OI manager is 15 years, as OI requires a long-term commitment, because the adoption of open innovation practices is an important strategic choice that involves the acquisition of external knowledge and licensing-out internal knowledge, and managers should understand the company well, and have a good reputation (Vanhaverbeke et al., 2017). Thus, sticking to the OI literature, the following is suggested:

P11: There is a positive relationship between the manager's tenure and the adoption of the OI practices as MI.

Cosmopolitanism/International Experience

According to Haas (2006) cosmopolitans are *"individuals with broad experience in many countries"* (p.367). In the innovation adoption literature cosmopolitanism has been found to have a positive impact on innovation adoption (Becker, 1970a; Becker, 1970b; Rogers and Shoemaker, 1971). Within the MI context a study by Kimberly and Evanisko (1981) demonstrates that the adoption of administrative innovations is strongly impacted by the cosmopolitanism of hospital administrators, i.e., managers. In the open innovation research, there is no clear link between the international experience of managers and the adoption of the OI practices. Rather, the majority of research is focused on the diversity of individuals' experience and, in particular, on work history diversity (e.g., Bogers et al., 2018b). Taking into account the definition provided by Haas (2006) this study views cosmopolitans as individuals with a broad range of international experience. Thus, the following is suggested:

P12: There is a positive relationship between the international experience of an individual and the adoption of the OI practices as MI.

Self-directed learning (SDL)

Another micro level factor that facilitates the implementation of management innovations that was identified by Khosravi et al. (2019) is self-directed learning (SDL). According to Knowles (1975) SDL is defined as: "*a process in which learners take the initiative, with or without the help of others, in identifying their learning needs, formulating learning goals, choosing learning resources, employing suitable learning strategies, and assessing learning*

outcomes" (p.167). Hiemstra (1994) suggests that the fast-changing business environment, the continuous generation of new knowledge, and an increased accessibility to information creates a need for SDL. The extant research suggests that SDL has a positive impact on management innovation in the form of administrative, market and technological innovation through managers' openness to a challenge, self-understanding, responsibility for learning and their inquiring nature (Ho, 2011). Therefore, firms that want to adopt new managerial practices can do so by delegating the process to individuals who demonstrate a higher level of self-organisation for learning. The introduction of the open innovation practices requires research on external partners, market research and others, and in some cases, it exposes individuals involved to new job roles, which essentially implies a long self-learning process. Thus, the following is suggested:

P13: There is a positive relationship between individuals' SDL and the adoption of OI practices as MI.

Following the discussions above, Figure 3.1 proposes the first research model of this study. Figure 3.1 demonstrates the relationships between the TOEI-MI contexts and the adoption of the OI practices as MI.

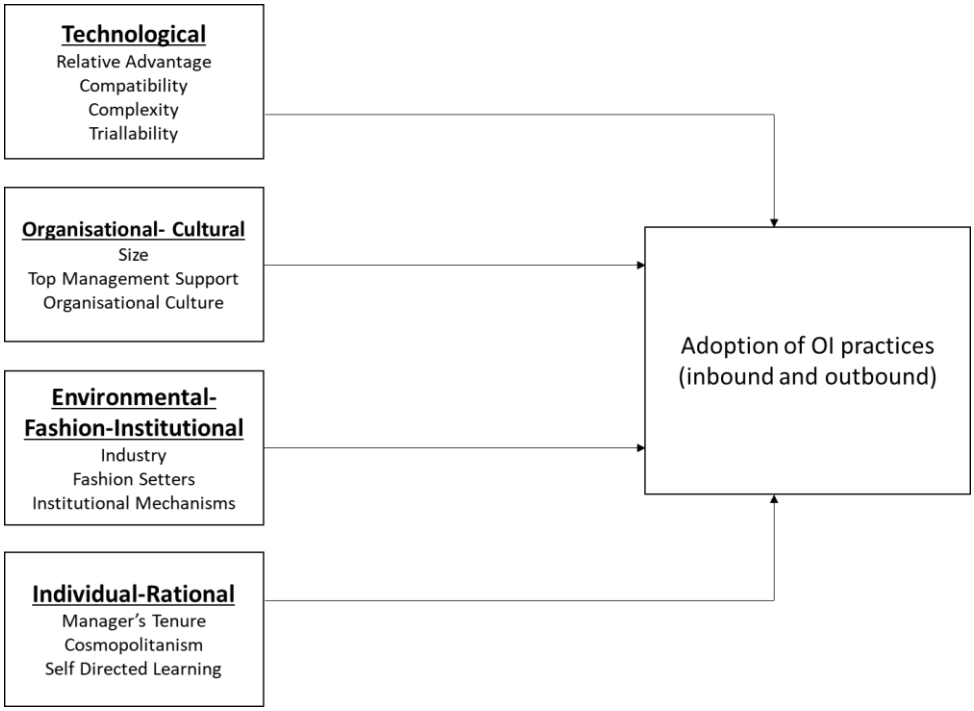


Figure 3.1. The TOEI-MI research model

3.5 POST-ADOPTION OUTCOMES: HOW DOES THE IMPLEMENTATION OF THE OPEN INNOVATION PRACTICES AS MANAGEMENT INNOVATION IMPACT INDIVIDUALS?

While the previous part of this chapter proposes the model that analyses what factors impact the adoption of the OI practices as MI, this section focuses on the post adoption outcomes of OI practices as MI. In particular, this section aims to investigate whether the implementation of the OI practices as MI impacts individuals' well-being at their workplaces. By investigating these outcomes this part of the study will address the following gaps. Firstly, the management innovations literature indicates that most of the literature is focused on analysing the factors that facilitate their adoption, rather than the outcomes associated with it (Khosravi et al., 2019). According to Armbruster et al. (2008), this could be linked to the absence of established measures both for the MI concept and for its outcomes. Secondly, and as already established in chapter 2 of this study, although there is sufficient empirical evidence that confirms the positive impact of OI implementation on firm performance, little is known about the outcomes associated with employees' personal perspectives and challenges (e.g., Bogers et al., 2017). For example, a study by Lifshitz-Assaf (2018) demonstrates that the application of open innovation practices in the form of crowdsourcing among NASA teams affects R&D professionals as they have to go through identity

transformations, but the ones who do not accept open innovation practices fail to convert solutions obtained through crowdsourcing into business processes. This suggests that employees may not feel happy with the implementation of the open innovation practices and may show decreasing levels of work engagement, work satisfaction and personal productivity, which in turn impacts on the firm's performance and its competitive advantage.

Therefore, to address the gaps in both domains, and to extend the TOEI framework, this study selected the following three dimensions to measure the individual level outcomes associated with the adoption of the open innovation practices as management innovation: *work engagement*, *work satisfaction* and *personal productivity*.

Work engagement

Work engagement is attributed to the field of positive psychology (Seligman and Csikszentmihalyi, 2000/2014), and is defined as: *"…a positive, affective-motivational state of fulfillment that is characterized by vigor (energy), dedication (strong involvement), and absorption (engrossed in the work activities)."* (Schaufeli et al., 2002, p.74 as appears in Bakker and Schaufeli, 2015). Schaufeli et al. (2006) suggest that employees who feel engaged in their work feel more connected to their work activities, have more positive emotions and they consider themselves to be more able to manage the requirements of their jobs, i.e., work engagement is negatively linked to burnout. The outcomes of work engagement are associated with health and happiness, improved job performance, extra-role behaviour, increased organisational commitment, increased motivation to learn and others (Bakker and Schaufeli 2015). A study by Harter et al. (2002) demonstrated that employees with a high level engagement also demonstrate a higher business-unit performance, i.e., work engagement is the source of competitive advantage to organisations, Bakker and Schaufeli (2015). Thus, it can be said that an organisation that wants to achieve a competitive advantage through introducing management innovation can do so through increasing the work engagement of their staff. Managers that want to improve their employees' work engagement can do so by introducing new job designs, amend job rotations and provide high job designs, because employees feel more motivated and curious to gain new skills (Bakker and Demerouti, 2008; Bakker and Schaufeli, 2015). The extant research suggests that the implementation of the open innovation practices (both inbound and outbound) requires that R&D staff refine their skill-set in order to identify, diffuse and make use of innovation

generated from open innovation activities (Salter et al. 2014). Thus, the following is suggested:

P14: The adoption of the open innovation practices as management innovation will have a positive impact on the individual's work engagement.

Work satisfaction

The concept of job/work satisfaction is an important research topic among psychologists and sociologists and it has a prominent place in the field of organisational studies (e.g., Christen et al., 2006; Hoppock, 1935; Locke, 1976; Mayo, 1945/2004; Mottaz 1985; Ramalho Luz et al., 2018). According to Locke (1976, p.1342) job/work satisfaction is defined as: "*the pleasurable emotional state resulting from the perception of one's job fulfilling or allowing the fulfilment of one's important job values*" or in other words, the coherence between the personal interests of an individual with what is offered by the firm (Baotham et al., 2010). High levels of job satisfaction were found to have a positive impact on organisational commitment and citizenship behaviour (Organ and Ryan, 1995; Williams and Anderson, 1991), as well as increasing presenteeism and decreasing employee turnover (Kinjerski and Skrypnek, 2008; Randsley et al., 2009; Zatzick and Iverson 2011). More importantly, empirical data suggests that employees who are more satisfied with their jobs also demonstrate general life satisfaction (Iverson and Maguire, 2000; Tait et al., 1989). Therefore, job satisfaction is an important indicator of organisational innovative behaviour/competitive advantage, because employees who are not satisfied with their jobs will demonstrate low interest and organisational commitment, and be absent, which leads to decreased organisational productivity (Bryant and Allen, 2013). Job satisfaction is linked to motivation, and as such, organisations that want to keep their employees satisfied with their jobs need to motivate them. The empirical data suggests that job satisfaction is linked to the introduction of intrinsically rewarding routines that in turn increases performance (although some scholars state that only extrinsic rewards can drive job satisfaction, e.g., Borjas (1979), Locke et al. (1980) such as, job complexity, level of responsibility, skill usage, helping others, enjoying challenging tasks, non-financial rewards and others (Currie and Hill, 2012; Luna–Arocas and Morley, 2015; Tausif, 2012). Thus, it can be said that an organisation that wants to adopt new management innovation practices that will enhance the employees' job satisfaction should do so by adopting practices that promote an intrinsic environment.

According to the literature, participation in open innovation activities is linked to intrinsic enjoyment. For example, studies on Open-Source software demonstrate that participants are motivated by purely intrinsic factors (Bitzer et al., 2007; Frick 2014; Ghosh, 2005; West and Lakhani, 2008). Frick (2014) suggests that individuals who contribute to open licensed projects demonstrate higher levels of productivity in comparison to those who do so for financial rewards. Similarly, in a recent study by Burcharth et al. (2017) both inbound and outbound open innovation practices were found to have a positive impact on employee autonomy, which in turn promotes job satisfaction (Foss et al., 2009; Parker et al., 1997).

Therefore, the adoption of open innovation practices as management innovation comes with activities that have an intrinsic nature, which in turn promotes an increased work satisfaction. Thus, the following is suggested:

P15: *The adoption of open innovation practices as management innovation will have a positive impact on the individual's work satisfaction.*

Personal productivity

Productivity is an important work performance measure, but the current literature states that there is no single definition of productivity that would fit everyone's perspective (e.g., Kim et al., 2019; Pritchard 1995). Pritchard (1995) suggests three cases that can define productivity. In the first case, productivity is considered as the economist/ engineer function, where productivity measures efficiency, i.e., the outputs over inputs ratio. In the second case, productivity is defined as a combination of efficiency (inputs/outputs) and performance (outputs/goals). In the third case, productivity has a broad definition and it views productivity as anything that makes something function better. In this scenario, productivity is not only limited to efficiency and effectiveness, but it also describes things like absenteeism, turnover, innovation, morale and others. In this study the focus is the third case, because it makes it possible to analyse individual productivity in a broader context. The research data suggests that personal productivity is driven by such factors as team dynamics (Bosch-Sijtsema et al., 2009), autonomy (Spivack and Rubin, 2011), working environments (Clements-Croome and Kaluarachchi, 2000), feedback (Dodd and Ganster, 1996), as well as personal factors such as intrinsic motivation (Hackman and Oldham, 1976), well-being (Wright et al., 2007) and work engagement (Xanthopoulou et al., 2009), as well as emotional and physical factors (Kim et al., 2019). Employees who are not productive, procrastinate, or do not put much effort into

their work might potentially withdraw from their jobs (Martin, 2005), which in turn will lead to lower competitive advantage for a whole organisation. Thus, workplaces need to ensure that their employees feel productive. This can be done through implementing changes in management practices, as management innovations are linked with the overall firm productivity through reducing administrative or transaction costs (Bloom et al., 2019; Bourke et al., 2020; Nieves, 2016; Oslo/OECD, 2015), as well as job productivity through improving employees' satisfaction levels and allocating their responsibilities (Nieves, 2016). Thus, the following is suggested:

P16. The adoption of open innovation practices as management innovation will have a positive impact on the individual's personal productivity.

Based on the discussions above, Figure 3.2 presents a second research model, which is focused on analysing the post adoption impact of the open innovation practices as management innovation across three dimensions.

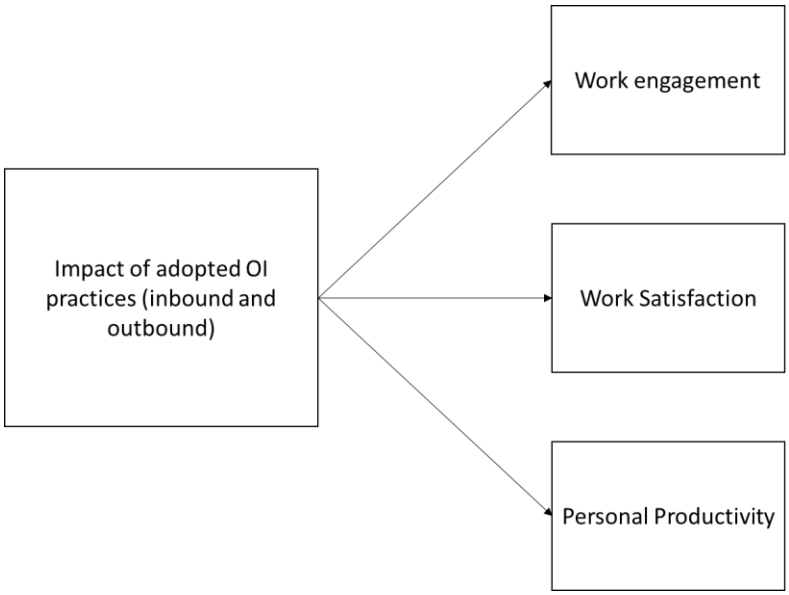


Figure 3.2. Post adoption impact of the OI practices as MI on individuals

3.6 SUMMARY

To sum up, this chapter has provided an explanation of the theoretical knowledge that this study is built upon. It started with an overview of the TOEI (Technological, Organisational, Environmental, and Individual) related research and explained the reasons behind its application to this study. It then moved onto demonstrating the integration of the management innovation (MI) perspective into the TOEI framework by including the four MI perspectives,

namely the institutional, cultural, fashion, and rational perspectives. This chapter then considered a selection of the factors chosen to analyse the adoption of OI as MI through a series of propositions. After this, the chapter introduced the second part of the research model, which is focused on the post adoption impact on the individuals as a result of the adoption of OI practices as MI. Figure 3.3 presents the two research models combined as one. As can be seen from Figure 3.3 the research model consists of two parts. Firstly, it aims to analyse the factors that impact on the adoption of the OI practices as MI within the TOEI-MI context. Secondly, it proposes to analyse how the adoption of OI practices as MI impacts on individual level outcomes across three dimensions: work engagement, work satisfaction and personal productivity.

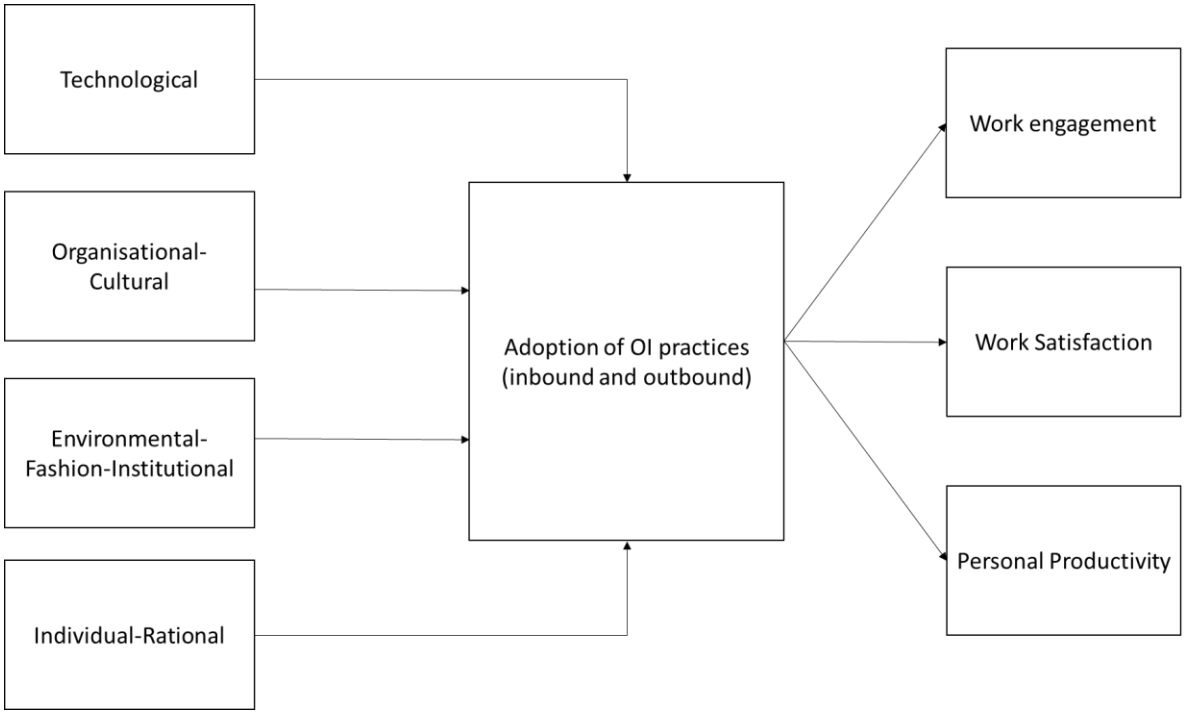


Figure 3.3. The research model developed for the study

The next chapter of this study will explain how the data will be collected and analysed to test the research model proposed.

CHAPTER 4. METHODOLOGY

4.1 INTRODUCTION

Chapter 4 introduces the methodology adopted for this study and it is structured in the following way. Firstly, it provides an overview of the methodological approaches chosen to conduct the research, e.g., research philosophy, approaches to theoretical development etc. Secondly, it explains the process of data collection and data analysis carried out for this study.

In order to make this chapter easier to navigate, this study adopts the *'research onion'* as a guidance tool. The '*research onion*', as shown in Figure 4.1, was proposed by Saunders et al. (2019) and it includes six steps/layers that guide a researcher through their research process. These steps/layers are: *research philosophy, research approach, methodological choice, research strategy, time horizons, techniques and procedures*.

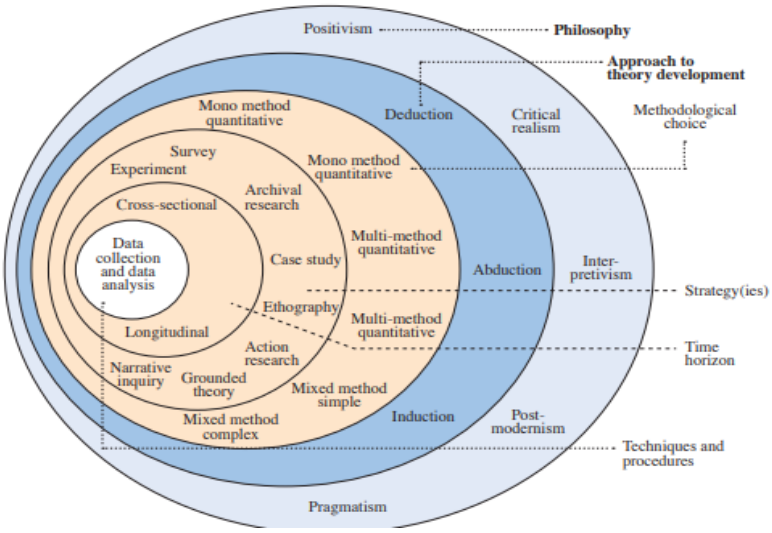


Figure 4.1. Research Onion. Source: Saunders et al. (2019)

Thus, following this guidance, this chapter starts with a discussion of research philosophy.

4.2 RESEARCH PHILOSOPHY AND THEORY DEVELOPMENT

4.2.1 RESEARCH PHILOSOPHY: INTERPRETIVISM

A research philosophy refers to the application of the abstract beliefs and assumptions that a researcher uses to develop their knowledge throughout the research process, i.e., how a researcher views the world (Creswell and Poth, 2016), Saunders et al., 2019). A research philosophy can also be referred to as a research paradigm. The latter term was popularised by a prominent American philosopher, Thomas Kuhn (1962), in his work *The Structure of Scientific Revolutions.* This work was used to discuss the common beliefs and generalizations shared by a group of experts concerning the nature of reality and knowledge. There are different stances on how to classify existing research paradigms. For example, Saunders et al. (2019) currently distinguish between the following types of research philosophy: *positivism*, *critical realism*, *interpretivism*, *postmodernism* and *pragmatism*. However, Hesse-Biber (2017) proposes three main types: *positivist, interpretive,* and *critical*. In general, however, there are two main paradigms that have guided researchers for many years: *positivism* and *interpretivism* (Collis and Hussey, 2014).

The literature suggests that there is no best philosophy for a certain type of research field as a research philosophy must be chosen in line with the researcher's own beliefs and ideas. In other words, the selection of the research philosophy is guided by a research question (Saunders et. al., 2009; Saunders et al., 2019). Thus, deciding on a correct research philosophy is an integral part of any research project as it forms how a researcher sees and understands their research questions, plans and chooses the methods and explains the findings (Crotty, 1998). Following these suggestions and based on the research questions and objectives outlined earlier in Chapter 1, this research will adopt *interpretivism* as the main research paradigm. The reasoning for choosing interpretivism is explained below.

According to Saunders et al. (2019), proponents of interpretivism focus on human beings as the driving force behind creating meaning rather than physical phenomena. On this note, Hesse-Biber (2017) suggests that scholars who adopt the interpretive approach focus on personal experiences and prospects. In other words, interpretivism suggests that humans and their social contexts cannot be analysed in the same way as their physical worlds. Myers (2008) states the following: "*Interpretive researchers assume that access to reality (given or socially constructed) is only through social constructions such as language, consciousness, shared meanings, and instruments*" (p.38). From this perspective, the interpretivist paradigm seems to be an appropriate choice for this research, since the main focus of this study is to

assess the individual perspective on the adoption of OI as MI, rather than the organisational one. In this study, therefore, individuals and their experiences are separated from their organisations.

As a research philosophy interpretivism was developed as a critique of the positivist paradigm, which focuses on organisations and other social institutions as real objects, and unlike interpretivism, positivism assumes that there is one true reality. According to Hesse-Biber (2017), the main difference between interpretivism and positivism lies in the fact that usually the interpretivist approach is associated with qualitative research, whereas the positivist approach is linked to quantitative studies as the researcher aims to analyse causal relations and focuses on scientific impartiality. In other words, the interpretivist approach explores the phenomenon under consideration, whereas positivism measures it (Collis and Hussey, 2014). From a business and management research perspective, the application of interpretivism implies that the researcher has to explore organisations through the eyes of employees and how they perceive their realities, i.e., 'subjective experiences through small-scale interactions' (Hesse-Biber 2017, p.22). This suggests that the researcher becomes a part of the research and has to be reflective, subjective and develop an empathetic position. The adoption of the interpretivist paradigm is suitable for business and management studies, because business environments provide unique and complex contexts, and illustrate how under certain conditions human beings interact and come together (Saunders et al., 2019), which is the case in this study.

As a research philosophy, interpretivism offers a number of advantages for this research. Firstly, because the main objective of this study is to analyse the adoption of OI practices as MI through the perspective of individuals, the application of the interpretivist paradigm allows the study to distinguish between human beings and their physical phenomena as well as focus on their values and experiences. Secondly, it allows us to focus on a small sample of qualitative data as well as it to interpret a variety of data. Thirdly, through an integration of the MI and OI concepts this study wants to explore the two research domains and propose a novel research framework for scholars and practitioners, and since the purpose of the interpretivist paradigm is to produce novel, richer insights and explanations of social environments, this study adopts interpretivism as its main research philosophy.

4.2.2 RESEARCH APPROACHES: ABDUCTIVE

In general, a scientific research can be guided by two types of logic, namely *inductive* and *deductive reasoning* (Collis and Hussey, 2014), or a combination of both of them, i.e.,

abductive (Peirce 1903/1997; Saunders et al., 2019). Choosing the right type of research logic is important, because it determines how a researcher decides to develop a theory and then test it.

A *deductive approach* is applied when a study moves from a general assumption to a specific one, whereas an *inductive approach* suggests that a study moves from a specific assumption to the general. In the case of the *deductive approach* a researcher confirms or refutes a theory based on a set of hypotheses (Collis and Hussey, 2014; Ketokivi and Mantere, 2010; Saunders et al., 2019). As for the *inductive approach* a researcher cannot confirm or refute the theory. Rather, it is used to establish it and propose a conceptual framework based on a set of observations (Collis and Hussey, 2014; Ketokivi and Mantere, 2010; Saunders et al., 2019).

The combination of both *deductive* and *inductive approaches* is called *abductive* (Ketokivi and Mantere, 2010; Saunders et al., 2019) and it was developed in order to help researchers to avoid dilemmas about which reasoning to apply as this can later impact on the development of a theory (Awuzie and McDermott, 2017). Peirce (1903/1997) as appears in Shani et al. (2019) states: *"Deduction proves that something must be; induction shows that something actually is operative; abduction merely suggests that something may be" (p. 230)."* This study chooses to adopt abductive reasoning for the following reasons.

Firstly, the research model of this study is built upon existing knowledge about the TOEI framework as demonstrated in chapter 3 of this study. Some of the adoption factors have already been identified as important not only by innovation scholars, but also by open innovation and management innovation scholars, e.g., industry, size of an organisation or the role of its top management. This suggests the deductive nature of this research. However, unlike in deductive studies, the objective of this study is not to purely *explain* the relationship between these factors. Rather, its objective is to *explore* and establish how these factors interact in the previously unexplored phenomenon of open and management innovation. In other words, this study aims to produce a novel research phenomenon and enrich the existing body of knowledge. This step suggests the inductive nature of the research. A combination of both of these steps leads to abductive reasoning.

Peirce (1903/1997) as appears in Shani et al. (2019) suggests that at the cognitive level a researcher that undertakes an abductive approach is led by a few questions, i.e., what is going on? What does it mean? Similarly, in this study based on the analysis of the literature the

objective is to explain the conceptualisation of the adoption of open innovation as management innovation, something that has not been researched before, and see whether this conceptualisation means something valuable (what does that mean?) for academia, practitioners and policy makers.

Thus, since this study integrates an existing theory to produce new knowledge or extend existing knowledge, abductive reasoning is found to be the most suitable. Finally and according to Saunders et al. (2019) abductive logic grants a researcher a great deal of flexibility, and as such, it corresponds to the nature of research conducted in business and management studies.

4.3 RESEARCH DESIGN

4.3.1 METHODOLOGICAL CHOICE: QUALITATIVE

There are two main research methods that determine the process of data collection and its analysis. These methods are known as *quantitative* and *qualitative*. One of the ways to distinguish between these two types of research method is the way they treat data. Quantitative research is focused on analysing so called hard data in the form of numeric data, while qualitative research is focused on analysing soft data in the form of words, photos, sentences and others (Neumann, 2012; Saunders et al., 2019). Since researchers can use the application of both methodological choices, i.e., mixed-method, more clarification on how to distinguish between these two choices is needed. On this note, scholars suggest that this methodological choice can also be differentiated by the application of a research philosophy, as was demonstrated earlier in this chapter (Collis and Hussey, 2014; Saunders et al., 2019). This study is guided by the qualitative choice for the following reasons.

Firstly, based on the list of questions generated for this study, as outlined in section 1.2 of chapter 1 of this study, it can be seen that this research is guided by a qualitative perspective from the beginning. In other words, in this study we question the phenomenon under investigation through the two questions of *what* and *how*, rather than *why*. According to Hesse-Biber (2017), the former group of questions is the norm for qualitative studies, whereas the latter is for quantitative research. According to Creswell and Poth (2018; 2013) qualitative research begins with questioning the phenomenon under investigation. Similarly, this study starts with questioning whether the adoption of the open innovation practices is a form of management innovation; and if it is then what is the relation between these two

research domains and how does it impact on the individuals that engage in these practices? This naturally suggests and confirms the qualitative nature of this study.

In order to study this problem and to address the existing research gaps as outlined in section 1.1 of chapter 1, this study selects individuals as the unit of analysis, which leads to the second point. In qualitative research, a researcher aims to understand the meaning and experiences of individuals, unlike in quantitative work, where a researcher tests a series of hypotheses (Hesse-Biber, 2017). Similarly, one of the objectives of this study is to explore the individual-level perspective and to understand the personal experiences of those individuals who are impacted by the adoption of OI as MI. On this note, Creswell and Poth (2018; 2013) state that in qualitative research the emphasis is placed on channelling the views of participants, which is in line with the objectives of this study since it aims to produce insights into how the individual perspective matters and how it can potentially contribute to the other levels of analysis.

In addition to the above and unlike quantitative studies, which are associated with the positivist paradigm, qualitative studies are generally placed within an interpretive paradigm (Creswell and Poth, 2018; Denzin and Lincoln, 2018; Saunders et al., 2019). Thus, as was already established earlier in this chapter, from the philosophical perspective this study adopts the interpretivist paradigm, which suggests that the reality is subjective and no single perception of truth exists. From this perspective, the objective of our study is to extract individuals' opinions on the adoption of OI as MI and how it impacts them. The opinions will be subjective to the participants and their observations as each case is unique. In other words, this study does not aim to test hypotheses and prove one universal truth. Rather it wants to explore and interpret various perspectives available. Besides this, the application of a qualitative method allows a certain degree of flexibility and further changes if needed, which is not the case with quantitative studies, which are pre-planned and hard to amend (Saunders et al., 2019). This is an important point for this research, since it explores a phenomenon that has not been studied before, and as such, flexibility is required.

Altogether the discussions above suggest that the choice of qualitative research is the most appropriate for this study since this choice is guided by the research questions as well as the research paradigm that this study is set within.

4.3.2 UNDERSTANDING THE PURPOSE OF THE RESEARCH: EXPLORATORY

Once a researcher has identified a research philosophy and a research approach, the next step is to define the purpose of the research. Based on this, researchers distinguish the following types of research: *exploratory*, *descriptive*, and *explanatory/analytical* (Collis and Hussey, 2014; Hesse-Biber, 2017). Collis and Hussey (2014) also suggest *predictive* as a type of research purpose.

While *exploratory* research is built upon exploring new ideas and generating knowledge in regard to a topic of interest through examining open questions, *descriptive* and explanatory research aims to have an accurate description of the topic under investigation in such a way that these two types of research are very structured and analyse the relationships between variables. A *predictive type* of research takes this even further by providing a prediction of a certain situation (Collis and Hussey, 2014). This study is *exploratory* by nature based on the following reasons.

Firstly and as already discussed in this section, the research questions of this study start with *'what'* and *'how'* rather than *'why'*, which can be the case with the other types of research discussed here (Collis and Hussey, 2014; Hesse-Biber, 2017). Thus, the purpose of this research is to explore the phenomenon rather than to describe or to explain its relationships. This leads to the next point, that exploratory research is usually conducted in areas that have not been studied before or remain under-researched, which is the case of this study. As was demonstrated earlier in chapter 1 and chapter 2 of this study, the conceptualisation of the adoption of OI as MI is a novel approach and there are no known precedents- apart from few exceptions that have been discussed in section 2.4.2 of chapter 2 of this study. Nevertheless, in order to answer what is the conceptual relation between OI and MI, and how the adoption of OI as a form of MI impacts on individuals, this study needs to gather data directly from participants, since there is not much knowledge on the subject under investigation and it is not feasible to test hypotheses in a quantitative manner. Thus, the main purpose of this research is to gain knowledge about the research problem and explore patterns based on interviews with the participants, which confirms its exploratory nature.

4.4 DATA COLLECTION

4.4.1 DATA COLLECTION METHOD

The data for this study has been collected through *primary data collection*. The rationale behind this is discussed below.

For *primary data collection* this study adopts semi-structured interviews because it uses a qualitative research method and it is an interpretivist study. According to Saunders et al. (2019) the research interview is: "*a purposeful conversation between two or more people, during which the interviewer asks concise and unambiguous questions and listens attentively to the interviewee talking"* (p.434). Traditionally there are three types of research interview: *structured, semi-structured,* and *unstructured* (Saunders et al., 2009; Saunders et al., 2019). *Structured or standardised interviews* use a predetermined set of same questions, usually with close-ended answers. When using structured interviews, a researcher has to read the questions exactly in the same manner and tone as they are written on paper to avoid any bias. Structured interviews are often used as a part of quantitative research methods. *Unstructured or non-standardised interviews* are in-depth interviews that may include dialogic or convergent subtypes as well, and they belong to qualitative research methods. This type of interview is quite informal as it does not use a predetermined set of questions and has open-ended questions. The main objective of this type is to explore a broader area of interest and allow new topics to emerge. *Semi-structured interviews* provide a balance between structured and unstructured interviews. This type of interview is non-standardised as well, but unlike unstructured interviews it begins with a predetermined list of topics and questions that define the direction of the interview. The application of the predetermined list of topics and questions is closely linked with the research philosophy adopted. For example, from an interpretivist perspective, which is the case for this study, the direction of the interview becomes more flexible and depends on each informant's input, and as such, the interview flow can change in the course of the conversation. From the other side, when a study applies either inductive, deductive or abductive approaches, semi-structured interviews allow a researcher to follow a certain pattern depending on the logic selected. For instance, in the case with an inductive approach the context of interviews can vary between participants, whereas in the case of deductive and abductive approaches there has to be a certain level of consistency in each interview as the study utilises previously known theories.

Because the research of this study is exploratory and at the same time it uses an existing theoretical framework, i.e., TOEI, it cannot apply structured and unstructured interviews for the reasons discussed above. Thus, semi-structured interviews are selected as the primary collection method, because this allows the required flexibility and it provides the consistency required for data collection. What is more, semi-structured interviews are the primary data collection method in interpretivist studies. Finally, according to the TOE literature studies

that employ the TOE model meet a certain degree of criticism as they only test the factors that have been tested in other TOE studies (e.g., Alshamaila et al., 2013). Thus, the application of semi-structured interviews for this study will allow the inclusion of other possible factors.

4.4.2 SAMPLING

The sampling strategy of any study should reflect the population from which it is obtained in a manner that is significant and can answer the research questions and objectives of a study. Therefore, in cases where it is impossible to collect data from every member of a study context, i.e., a census, or a study has strict research deadlines, which is the case with most PhD projects, consideration of sampling becomes an effective option. There are two types of sampling strategies: *probability/representative and non-probability/non-random sampling*. While the first one is applicable to quantitative research, the second one is associated with qualitative studies, which is the case for this study. Unlike probability sampling, in non-probability sampling there is no advanced knowledge of the sample size. In other words, in qualitative studies the cases are selected as the study progresses (Neumann, 2012). As a result, there are no requirements on how big the sample should be, and the sample size depends rather on the research questions and objectives as well as the credibility of the findings (Patton, 2015; Saunders et al., 2019). Some researchers, though, suggest keeping the sample size between 12 and 30 when participants come from a heterogeneous group, and between 5 and 12 when participants represent a homogenous group (Saunders et al., 2019).

Non-probability sampling is represented by the following techniques (Collis and Hussey, 2014; Saunders et al., 2019): *convenience/natural, quota, volunteer/snowball/networking* and *purposive/judgemental samplings. Convenience sampling* is based on the availability of participants/cases, e.g., street interviews for TV, whereas *quota* sampling is applied as a substitute for probability sampling as a part of online surveys. *Volunteer sampling*, also known as snowball sampling, is used for sampling participants from a network by applying a snowball effect, while *purposive sampling* is applied in explorative research where a researcher uses personal judgement and prior knowledge to select samples, and it is sometimes referred to as judgemental sampling. This study adopts purposive sampling primarily for the following reasons.

Firstly, the main advantage of purposive sampling is that it allows a researcher to select individuals who are closely related to the research domain and are able to demonstrate high levels of proficiency, and, most importantly, these individuals do want to provide this

information (Creswell and Clark, 2017). The purpose of this study is to understand the individual-level perspective of the adoption of OI as a form of MI, and as such, this study needs to focus on those professionals who are behind the adoption decision, i.e., a purposeful selection is needed. The application of purposive sampling will, thus, allow this study to filter out participants who do not fit with the research criteria, unlike in the case with snowball or convenience sampling. Secondly, it is also important to note that purposive sampling is a recommended and preferred sampling strategy among qualitative scholars (Creswell and Poth, 2018; Daniel, 2011; Hesse-Biber, 2017). Thus, following general recommendations and based on the objectives of this study this sampling technique is found to be the most suitable and beneficial.

4.4.3 SELECTION OF SAMPLING FRAME

Based on purposive sampling the selection of the sampling frame should have a clear set of criteria for inclusion, which are as follows. Firstly, because this study mainly focuses on the role of individuals in the adoption of open innovation practices as management innovation, the main inclusion criteria involved interviewing individuals that are engaged in the adoption decisions about open innovation. Thus, from this perspective the selected participants or the research population for this study were the 'key informants' as suggested by Squire et al. (2009) and Campbell (1955) and used in the OI study by Huber et al. (2020). To expand further, the key informants were identified as top managers as according to the existing research on open innovation this is the group of people that play an important role in facilitating the process and they possess a certain level of knowledge and expertise (e.g., Ahn et al., 2017; Chesbrough and Brunswicker, 2013).

The second inclusion criteria were the organisations that the participants represent. From this perspective, the study tried to keep a healthy balance between high-tech and low-tech organisations, as well as the regions they represent. At the same time the study tried to ensure that the organisations participating in this study are involved in innovative activities and that they represent innovative industries.

As shown in figure 4.2, the following steps were carried out to identify participants that correspond to both inclusion criteria:

1) Based on the researcher's international and professional background, a list of potential interview candidates was created based on the screening of LinkedIn connections, i.e., 1st, 2nd and 3rd+ degree connections.

2) Once the list was created, the LinkedIn profile of each participant was examined thoroughly. The purpose of this step was to ensure that the participant is a 'key-informant' and has exposure to innovative activities based on their LinkedIn activities and job descriptions. If a participant was not found to be suitable for the interview, they were excluded from the potential list, e.g., a very junior position or a participant has not been involved in any types of innovation activities for a while.

3) During this step the selected participant company's background was analysed to understand what kind of activities the company is engaged in, how innovative the company is, whether they practise any type of open innovations based on news search etc.

4) Following the steps outlined above the researcher then established personal contact with potential participants to obtain permission to be interviewed. The participants were contacted through various sources, e.g., LinkedIn, email or personally by phone. This stage had two objectives. Firstly, in order to establish trust and credibility for this study, the researcher was engaged in prolonged conversation with potential participants long before the actual data collection started. The conversation was rather informal and friendly. Secondly, during this stage it was important to ensure that a participant wanted to share information voluntarily as per the philosophy of purposive sampling.

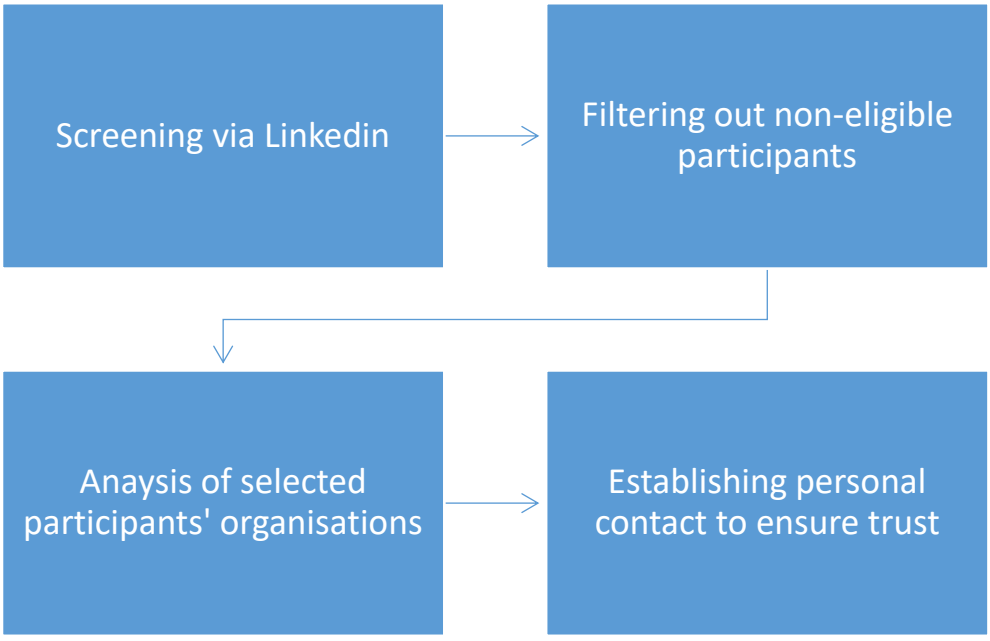


Figure 4.2. Selection of sampling frame

Table 4.1 provides a final list of participants that took part in this study as well as their demographic details. In total 22 participants were interviewed, which is in accordance with

the recommendations in Saunders et al. (2019) who suggest keeping the sample size between 12 and 30 cases for qualitative heterogeneous semi structured interviews. The participants in table 4.1 are organised in the same order as they were contacted and interviewed. Table 4.1 includes the following details. Firstly, the participants' identification number followed by their gender and age. Secondly, it includes their professional details, such as years of experience in their profession, their current position, the industry their organisation operates in and the size of their company. The last column indicates the current geographic location of the participants; this will be used later to analyse the impact of international experience on the adoption.

Table 4.1. Profile of the participants

Participant N	Gender	Age	Years of Experience	Position	Industry	Size	Current Location
P1	F	32	10	Senior Marketing Manager	Technology	Large	United Kingdom
P2	M	34	10	Marketing and Digital Director	Advertising and Marketing	Large	Hong Kong
P3	M	35	10	Founder	PropTech	Small	Hong Kong
P4	M	41	18	Vice President	Education	Small	Hong Kong
P5	M	30	10	Investment Manager	Investment Management	SMEs	United Kingdom
P6	M	38	18	Head of Product and Marketing	Cryptocurrency	SMEs	Japan
P7	M	40	16	Regional Vice President for Digital	Hospitality	Large	Hong Kong
P8	M	34	13	Co-founder	RegTech	Small	United Kingdom
P9	M	55	30	Co-founder and CEO	EdTech	Small	Hong Kong
P10	M	36	13	Co-founder and CEO	PropTech	Small	Hong Kong
P11	M	40	17	Head of Digital	FinTech	Large	United Kingdom

P12	M	49	28	Head of R&D	Advertising and Marketing	Large	Singapore
P13	M	36	12	Marketing Director	Advertising and Marketing	Small	United Kingdom
P14	F	32	10	Senior Business Director	Reinsurance	Large	Hong Kong
P15	M	45	22	General Manager	Technology	Large	Hong Kong
P16	M	30	10	Regional Vice President for Digital Strategy	MarkTech	Large	United Kingdom
P17	F	33	10	Senior Academic Manager	Education	Large	Kazakhstan
P18	M	33	11	Open Innovation Manager	IT Services	Large	India
P19	M	47	23	Co-Founder and Exec director	MarkTech	Small	Singapore
P20	F	34	16	Corporate Projects Manager	Commodities Trading and Investment	Large	Hong Kong
P21	F	35	12	Head of Digital	Media	SMEs	Colombia
P22	F	32	10	Senior Director for Digital	Marketing and Advertising	SMEs	United Kingdom

4.4.4 INTERVIEW DESIGN AND STRUCTURE

Although there is no universal guidance on the way in which semi-structured interviews should be designed, this study follows the recommendations provided by Saunders et al. (2019). Additionally, because this study uses the TOE framework as a theoretical basis, it closely follows the template of semi-structured interviews as suggested by Alshamaila et al. (2013) and Ramdani (2008). Thus, the interview process used to collect the data for this study consists of two steps as outlined below and as shown in Figure 4.3:

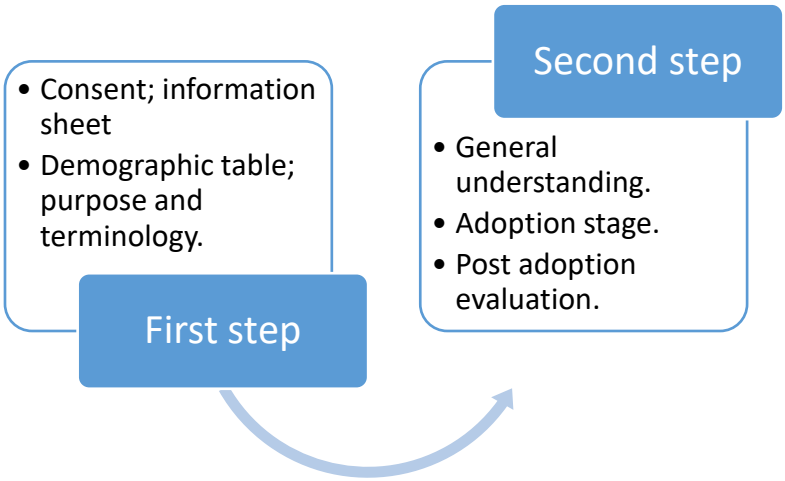


Figure 4.3. Structure of the interview process

1) The first step was carried out upon obtaining a verbal agreement to participate in the research. The participants were contacted by email and were sent the following important documents:

a) Two documents required by the Human Subjects Ethics Sub-committee (HSESC) (or its Delegate) of The Hong Kong Polytechnic University. One document is a *consent form to participate* in the research in accordance with HSESC. The second document is an *information sheet* as required by the HSESC. In this information sheet participants were provided with an explanation of the confidentiality procedures, the ways their personal information would be stored and collected, as well as their rights to withdraw from the research at any point.

b) One document *created by the researcher* as a part of data collection process. This document has two parts. Firstly, a table for the participants to fill in their personal details such as age, working experience, size of their organisation etc. Secondly, purpose and terminology of the interview, in which participants were invited to familiarise themselves with basic terminology about management and open innovation and inbound and outbound open innovation practices.

c) Along with the documents outlined above, the email body also contained *the list of open innovation practices* used as per Stanko et al. (2017) and Mazzola et al. (2012). This was done in order to ensure that participants are familiar with existing types of the OI practices.

2) The second step of the interview consisted of a *document with the actual interview questions*. This document was not sent to the participants in advance in order to avoid biased answers and it was designed based on the recommendations of Alshamaila et al. (2013), Ramdani (2008) and other TOE related studies. The document used to conduct semi-structured interviews has three sections:

a) **General understanding of the OI and MI concepts**. This section assesses the level of knowledge that a participant possesses about OI and MI, and how these concepts are operationalised in the organisations they represent. Additionally, this is the part where participants would name the open innovation practices their organisations practise from the list they were sent during the first phase.
b) **Adoption Stage**. This section consists of the four TOEI contexts as outlined in chapter 3 of this study. Each of the contexts is represented by two types of question. Firstly, any general factors that might affect the adoption of open innovation practices. Secondly, questions around specific factors if they have not been discussed in the previous part, e.g., what is the impact of top management support (organisational context of the TOEI) on the adoption of open innovation practices? The aim of this stage is to validate the study's research model and discover any new potential factors.
c) **Post adoption stage**. Similarly to the previous section, this section consists of two types of questions. Firstly, a general question to evaluate the impact of the adoption of open innovation practices on the participants' managerial routine etc. Secondly, specific sets of questions to understand the impact of the adoption of open innovation practices on their work engagement, satisfaction and productivity.

Both parts of the interviews, including the information sheet, can be found in Appendix A, B and C.

4.4.5 DATA SATURATION

The interviews were collected from October 2020 to January 2020 once the researcher obtained the human ethics approval from HSESC of the Hong Kong Polytechnic University. The total number of interviews is 22 and all of them were conducted in English. Out of these 22 interviews, three interviews were conducted as pilots. The changes were noted and applied to the final versions. For example, the language of the interview became less formal to avoid any confusion for participants due to the international backgrounds of some of the participants and English not being their first language. All interviews were done online over a

videoconferencing platform Zoom due to the global pandemic and in accordance with HKSAR Covid'19 social restrictions measures, as well as the geographical locations of some of the participants. As a research tool the application of Zoom has been widely studied and validated by other scholars (e.g., Archibald et al., 2019; Lobe et al., 2020). The interviews were conducted within the timing specified by the participants, so this does not affect their professional commitments. For example, in one case the interview was conducted with the participant from Colombia at 8am Hong Kong time, which is 7pm in Colombia as it is after working hours for the participant. In another scenario, the interview with participants from the UK were conducted during their lunch times, which is 9pm Hong Kong time. The interviews lasted anywhere from 35 minutes to 1 hour 20 minutes. The average duration was 50 minutes. Upon the completion of each interview the Zoom audio file was downloaded to the personal computer, and then transcribed via the software called Descript. In order to enjoy the full benefits of the software monthly subscriptions for both of them were purchased and renewed as needed. The total number of cleaned-up transcripts resulted in 166 pages. Each transcribed file was then copied and edited in Word and sent to each participant for their confirmation. Out of 22 participants 10 participants came back with modified documents that included their personal comments and adjustments, which were immediately applied into the original file. The rest of the participants just made a general acknowledgment, made a few verbal suggestions and asked to be informed them when the final results were published.

The data collection stopped once it reached data saturation. According to Saunders et al. (2019) data saturation is the phase when any newly collected data provides very few or no novel insights. Thus, once no new themes or categories emerged it was found appropriate to stop the data collection process.

4.5 PHASES OF DATA ANALYSIS

The data analysis process for this study was carried out in two phases. Firstly, there was a three-step qualitative analytical procedure as suggested by Miles et al. (2014) and Miles and Huberman (1994). Secondly, this study applied a text-mining technique to supplement the findings obtained from the first step.

4.5.1 QUALITATIVE DATA ANALYSIS

Based on qualitative research methods a data analysis process has to happen immediately after data is collected. Thus, following up each interview and the data transcription process, a process of data analysis was performed. For data analysis this study adopted a three-step

analytical process proposed by Miles et al. (2014), Miles and Huberman (1994), as demonstrated in Figure 4.5:

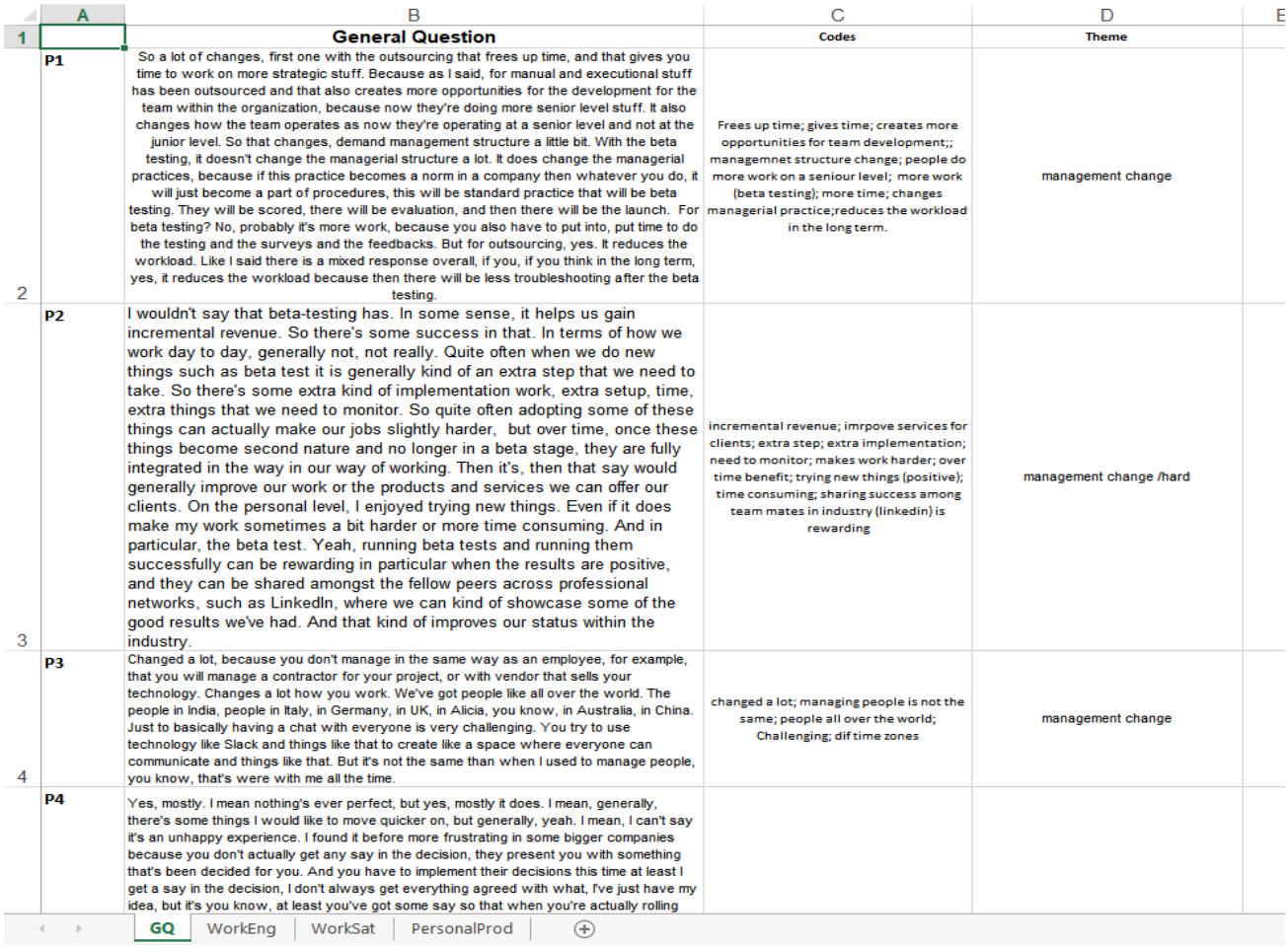
1) Data reduction: a process of choosing, focusing, streamlining, summarising, and transforming the collected data from notes or transcriptions. The process of data reduction is happening constantly throughout the course of qualitative studies. During the data reduction process a researcher decides what parts of the data need to be coded and which need to be removed. The data that has not been included in the final data reduction pool is called 'extended text'.

The analytical procedure for this step was performed in Microsoft Excel and Microsoft Word. Firstly, during an interview the researcher took notes on whether the participant agrees with or rejects the propositions for each of the TOEI contexts as well as post adoption, then straight after each interview the researcher entered these observations into a separate Microsoft Excel file along with any new factors identified.

Secondly, the interview transcript was copied from Descript software and then the researcher went through a process of eliminating such fillers as 'um', 'oh', too many repetitions of words like 'you know', 'I mean', as well as any small talk or any parts where a participant's name or their employment was mentioned.

2) Data display is a process of displaying reduced data that allows a researcher to assess whether a further analysis is needed, or whether the data is ready for conclusion. Data display allows a researcher to compare different angles of the collected data, discover key patterns, and analyse relationships.

Once the data from the first step has been cleaned and made available in the form of a Word document, the text was further split in such a way that it corresponds to the structure of the interview, i.e., a) general part; b) TOEI contexts; c) post adoption part. This text was then entered into Microsoft Excel. For example, Figure 4.4 demonstrates a snapshot of the spreadsheet that contains the post adoption analysis. Each of the factors is split into separate Excel tabs, i.e., 'General Question', 'Work Engagement', 'Work Satisfaction' and 'Personal Productivity'.



	A	B	C	D	E
1		General Question	Codes	Theme	
2	P1	So a lot of changes, first one with the outsourcing that frees up time, and that gives you time to work on more strategic stuff. Because as I said, for manual and executional stuff has been outsourced and that also creates more opportunities for the development for the team within the organization, because now they're doing more senior level stuff. It also changes how the team operates as now they're operating at a senior level and not at the junior level. So that changes, demand management structure a little bit. With the beta testing, it doesn't change the managerial structure a lot. It does change the managerial practices, because if this practice becomes a norm in a company then whatever you do, it will just become a part of procedures, this will be standard practice that will be beta testing. They will be scored, there will be evaluation, and then there will be the launch. For beta testing? No, probably it's more work, because you also have to put into, put time to do the testing and the surveys and the feedbacks. But for outsourcing, yes. It reduces the workload. Like I said there is a mixed response overall, if you, if you think in the long term, yes, it reduces the workload because then there will be less troubleshooting after the beta testing.	Frees up time; gives time; creates more opportunities for team development;; managemnet structure change; people do more work on a seniour level; more work (beta testing); more time; changes managerial practice;reduces the workload in the long term.	management change	
3	P2	I wouldn't say that beta-testing has. In some sense, it helps us gain incremental revenue. So there's some success in that. In terms of how we work day to day, generally not, not really. Quite often when we do new things such as beta test it is generally kind of an extra step that we need to take. So there's some extra kind of implementation work, extra setup, time, extra things that we need to monitor. So quite often adopting some of these things can actually make our jobs slightly harder, but over time, once these things become second nature and no longer in a beta stage, they are fully integrated in the way in our way of working. Then it's, then that say would generally improve our work or the products and services we can offer our clients. On the personal level, I enjoyed trying new things. Even if it does make my work sometimes a bit harder or more time consuming. And in particular, the beta test. Yeah, running beta tests and running them successfully can be rewarding in particular when the results are positive, and they can be shared amongst the fellow peers across professional networks, such as LinkedIn, where we can kind of showcase some of the good results we've had. And that kind of improves our status within the industry.	incremental revenue; imrpove services for clients; extra step; extra implementation; need to monitor; makes work harder; over time benefit; trying new things (positive); time consuming; sharing success among team mates in industry (linkedin) is rewarding	management change /hard	
4	P3	Changed a lot, because you don't manage in the same way as an employee, for example, that you will manage a contractor for your project, or with vendor that sells your technology. Changes a lot how you work. We've got people like all over the world. The people in India, people in Italy, in Germany, in UK, in Alicia, you know, in Australia, in China. Just to basically having a chat with everyone is very challenging. You try to use technology like Slack and things like that to create like a space where everyone can communicate and things like that. But it's not the same than when I used to manage people, you know, that's were with me all the time.	changed a lot; managing people is not the same; people all over the world; Challenging; dif time zones	management change	
	P4	Yes, mostly. I mean nothing's ever perfect, but yes, mostly it does. I mean, generally, there's some things I would like to move quicker on, but generally, yeah. I mean, I can't say it's an unhappy experience. I found it before more frustrating in some bigger companies because you don't actually get any say in the decision, they present you with something that's been decided for you. And you have to implement their decisions this time at least I get a say in the decision, I don't always get everything agreed with what, I've just have my idea, but it's you know, at least you've got some say so that when you're actually rolling			

GQ | WorkEng | WorkSat | PersonalProd

Figure 4.4. Data display in Microsoft Excel

3) Drawing/verification of conclusions is a process of interpreting and analysing the final data. The conclusions cannot be reached until after the data has been fully collected. Once the conclusions have been made, the researcher needs to verify and test the data for its validity, i.e., the verification process.

The analytical procedure for this step was performed in Microsoft Excel. Side by side comparison was done between each of the factors of the TOEI framework, answers given by the participants were reread a few times, recurring themes were colour coded for an easier navigation and then added to the final findings.

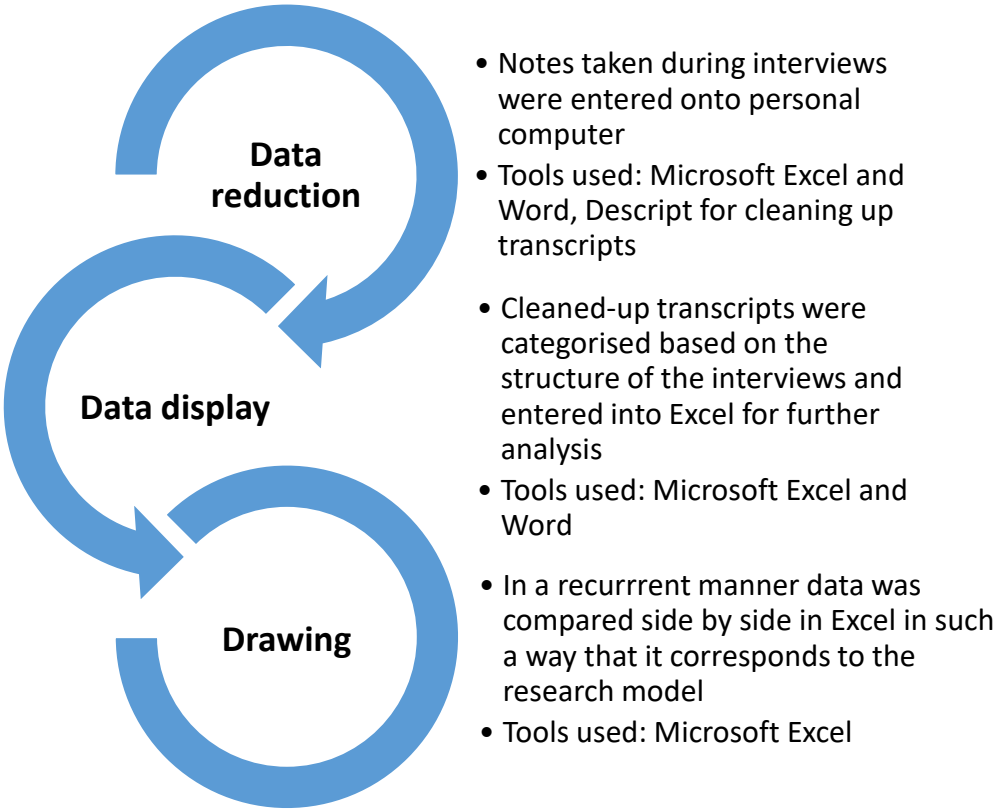


Figure 4.5. Data analysis performed as per Miles and Huberman (1994)

The three steps described above in figure 4.5 are concurrent and are performed simultaneously. Throughout the data analysis process a researcher can move between any of these three steps until the final conclusions have been made and verified. Thus, qualitative data analysis is an enduring, recurrent process (Miles and Huberman, 1994).

4.5.2 TEXT MINING

In order to supplement and discover new findings from the interviews, and to produce robust results, this study adopted text-mining analysis using software called WordStat. This software allows a researcher to extract new themes and trends and conduct a content analysis based on already available full body texts. These texts can be in the form of pdf files, online journal articles, word files and others. In the case of this study, the files uploaded were cleaned transcripts of the interviews with the participants. The transcripts included the participants' answers around three interview areas, i.e., general part of MI and OI, adoption factors, post adoption impact and excluded the researcher's questions. In total twenty-two transcripts in no particular order were uploaded as a project for the text-mining analysis.

Prior to running the analysis in WordStat the researcher needs to set certain criteria for the pre-processing part: *lemmatization* and *exclusion.* The former ensures that words with the

same root are treated as one word e.g., ‘study-studying’; the latter excludes such words as ‘yeah’, ‘a’, ‘the’ and others. It is important to note that the text-mining analysis used for this study should be only seen as a complimentary technique that should help the researcher to reveal a bigger picture from the data collected. Therefore, *the manual process* of lemmatization, exclusion and even replacement was only applied for exceptional keywords. For example, ‘OI’ and ‘open innovation’, ‘MI’ and ‘management innovation’- are treated as one keyword in the context of this study. In other words, the main focus of the text-mining analysis in the case of this study is to *explore the relationships* between the keywords rather than focusing on their linguistic meanings.

As an illustrative example, Figure 4.6 demonstrates the process of exclusion.

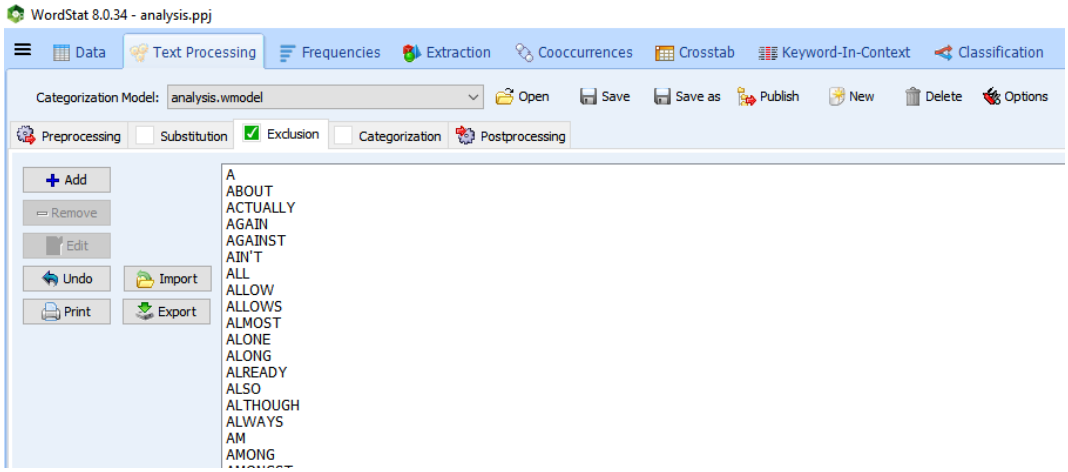


Figure 4.6. Process of Exclusion in WordStat

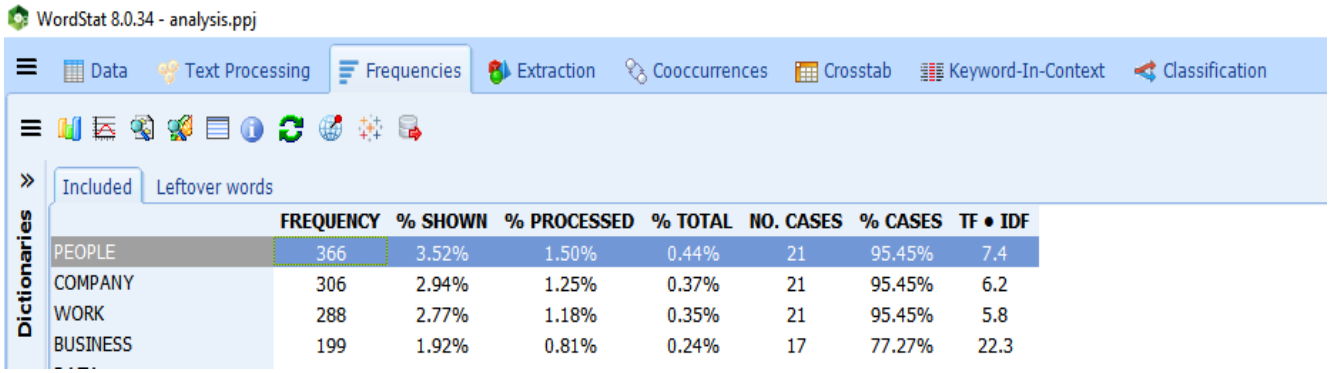
The analysis is then performed across the following areas as illustrated in Figure 4.7:

-*Frequencies (terms).* The Frequency tab is used to show the frequency of certain words appearing in a text (cleaned-up transcripts in the case of this study). By default, the words retrieved by the software are organised in descending order.

-*Extraction (topics, phrases).* The Extraction tab demonstrates how often certain phrases were used by the participants. In other words, the software retrieves the most used phrases based on the transcripts uploaded.

-*Co-occurrences (dendrogram, mapping, link analysis etc.).* The Co-occurrences tab includes such options as dendrograms, mapping or cluster analysis. The key point of this tab

is to demonstrate how keywords that demonstrate higher correlation within a certain topic are related.



	FREQUENCY	% SHOWN	% PROCESSED	% TOTAL	NO. CASES	% CASES	TF • IDF
PEOPLE	366	3.52%	1.50%	0.44%	21	95.45%	7.4
COMPANY	306	2.94%	1.25%	0.37%	21	95.45%	6.2
WORK	288	2.77%	1.18%	0.35%	21	95.45%	5.8
BUSINESS	199	1.92%	0.81%	0.24%	17	77.27%	22.3

Figure 4.7. Snapshot of the analysis in Wordstat

The researcher can then extract the generated results to any external program for a further analysis. In the case of this study, the results were extracted to Microsoft Excel.

4.6. VALIDITY OF THE RESEARCH

In any type of research, be it quantitative or qualitative, the researcher needs to ensure the quality and accuracy of their research. While in quantitative studies a researcher can demonstrate the quality of their research through generalisability and validity, in qualitative studies that are built on an interpretive philosophy, it becomes more challenging to demonstrate that the research is credible and high-grade. On this note, some researchers might argue that such terms and validity and generalisability are not applicable to qualitative studies. With regard to this, Lincoln and Guba (1985) developed the following measures for qualitative studies as analogies of quantitative research. These are: 'dependability' instead of 'reliability', 'credibility' instead of 'internal validity', 'transferability' instead of 'external validity'. These measures should not be seen as a direct substitute to our quantitative understanding of validity and generalisability rather they are alternative strategies. Thus, in order to strengthen the accuracy of this research the following steps were taken:

1) Credibility/ internal validity. According to Lincoln and Guba (1985) credibility or internal validity means that the research participants are portrayed in the same way as they intend. This is one of the most important criteria to ensure the 'validity' of qualitative research. Thus, to increase the credibility of the research, a researcher needs to establish trust with the participants, share data with the participants, and the participant is able to communicate their comments and feedback, as well as discuss the ideas and results with a different person.

The credibility of this study has been enhanced in the following ways: a) Prior to data collection the researcher established contact with the potential participants, verbally communicating to them their confidentiality rights and other ethical considerations of the research, its importance and whether they wish to participate. For example, the participants were contacted back in spring/summer 2020, while the actual data collection process started in October. This prolonged engagement ensured that both the participants and the researchers have a relationship of trust; b) as outlined in the previous sections of this chapter, all verbatim transcriptions were sent back to the participants for their verification, and their feedback was applied to the data, while the others provided verbal suggestions, i.e., member checking. As mentioned above, this point is crucial in establishing the credibility of this study, as in qualitative research the participants are the ones who can verify the credibility of their own words; c) the outcomes of the data collection were discussed closely with one of the supervisors of this project to ensure independent reflection and the accuracy of the findings.

2) Transferability/ external validity or generalisability. According to Lincoln and Guba (1985) transferability or external validity ensures that the results of a qualitative study can be transferred to other research settings. It is, however, important to note the results obtained from qualitative studies are normally used to generate rich insights for future theory development and as such the results cannot be generalised in the same manner as it happens in quantitative studies. In other words, it is not the objective of qualitative studies to provide statistical generalisation. Accordingly, Lincoln and Guba (1985) state: *"It is, in summary, not the naturalist's task to provide an index of transferability, it is his or her responsibility to provide the data base that makes transferability judgements possible on the part of potential appliers"* (p.316). Thus, to ensure that the findings of this study can be potentially transferable the following steps have been taken: a) the research sample targets the participants from various industries and regions to avoid bias and to provide a holistic view; b) the research design provides thick description, and reflects the researcher's personal experiences. For example, participants that were based in different time zones were interviewed at the most convenient time for them to ensure that the interview process does not affect their professional obligations and they do not feel under pressure. Another example can be a detailed description of the software used for the data collection and analysis (e.g., Descript, Zoom, Wordstat). Thus, the reader can evaluate the degree of transferability for themselves.

3) Dependability/ reliability. According to Lincoln and Guba (1985) this criteria ensures that the research produced is reliable, can be evaluated by others and that its data is consistent over time. In qualitative interpretivist studies, the reality changes as the research moves forward, so it is important to account for every change. The consistency and reliability of this research was enhanced through documenting every single step for data collection and data analysis, presenting it in a transparent manner to the reader. This includes pilot modifications, reaching out strategies, the software used for data analysis, screenshots, as well as the interview templates used for this study (see Appendix B and C).

4) Confirmability is the last criterion of the qualitative research trustworthiness as per Lincoln and Guba (1985) and it ensures the objectivity of the research's findings. Confirmability of this study was achieved through an audit trail, which means that the researcher documents every step of the research process (already described in the previous step), and explains their decisions.

4.7 RESEARCH ETHICS

The following steps have been taken to ensure that this research is in line with ethical principles. Firstly, ethical approval was submitted to the Human Subjects Ethics Sub-committee (HSESC) of the Hong Kong Polytechnic University prior to conducting data collection. The ethical approval submitted included information about the objectives of the current study, its importance along with how data will be collected. Once the approval was granted, the data collection process began.

Secondly and upon the completion of the first step, each participant was sent an email that contained two documents to ensure the ethical protocol as requested by the Hong Kong Polytechnic University. The first document included a consent form, where the participant was asked to confirm that their participation is voluntarily and which explained their rights to privacy. The second document contained information about the research aims, participants' rights to withdraw from the research at any point, and it explained their rights to ask questions. It also outlined how their data would be used, stored and protected. With regard to the latter the data was stored on the researcher's personal computer under different codes. In other words, at no point were the names of participants or their association with their companies revealed, as their names were masked. After each interview the participant was sent a cleaned-up transcript for their acknowledgement. In a few instances, participants asked

to remove the names of their previous employments. All comments and suggestions were carefully followed in order to protect participants' rights to confidentiality.

4.8 METHODOLOGICAL LIMITATIONS

This study has the following methodological limitations. Although there is a great deal of value in using 'key informants' as suggested by Squire et al. (2009) and Campbell (1955), by applying this sampling this study limits itself to the knowledge provided by these informants. Some of the 'key informants' may not feel comfortable sharing all the knowledge they possess, while not targeting other group of individuals such as analysts or assistants may deprive this study of experience and knowledge that happens at a lower level. Another limitation of this study is the application of semi-structured interviews that were conducted online. While this design allows us to obtain a participant's view and explore it in-depth, it was quite challenging to observe emotions and the different reactions that can happen during face-to-face interviews and can potentially impact their course.

4.9 SUMMARY

To sum up, this chapter has provided a detailed overview of the methodology selected for this study. It started by explaining the rationale behind choosing the interpretivist research philosophy along with an abductive theoretical approach. Then it moved onto discussing the methodological choices for this study, which is the qualitative research design. Further, the data collection method of 22 semi-structured interviews along with the data analysis consisting of two phases, namely a qualitative analytical procedure and text-mining, were documented and explained in great detail. Finally, it explained the techniques used to enhance the credibility and validity of the current study as per Lincoln and Guba (1985). The next chapter of this study will present the findings based on the procedures described in this chapter.

CHAPTER 5. FINDINGS

5.1 INTRODUCTION

Chapter 5 introduces the research findings obtained during the data collection process, as was outlined in chapter 4 of this thesis. Therefore, this chapter will be structured in the following way. Firstly, it presents a description of the participants. Secondly, it presents the findings from the qualitative data analysis in three parts: a) typology of the open innovation practices as management innovation; b) the factors that impact on the adoption of open innovation practices within the four contexts of the TOEI framework; c) the post-adoption impact of the open innovation practices on the participants' well-being. Finally, it supplements these findings with the data obtained from the text mining analysis from the Wordstat software.

5.2 DESCRIPTION OF THE PARTICIPANTS

In the open innovation literature, there are the following main streams that measure how much companies are involved in open innovation activities. A classic approach proposed by Chesbrough and many other authors assumes that companies should open up their business model across two dimensions, *inbound* and *outbound* (Bianchi et al., 2011; Cheng and Huizingh 2014; Gassmann and Enkel 2004) and another approach, suggested by Laursen and Salter (2006), focuses on the *breadth* and *depth* of open innovation practices. There is also the one outlined by Dahlander and Gann (2010): *pecuniary* and *non-pecuniary* openness. Since this study first asked the participants to indicate which open innovation practices they adopt, i.e., inbound and/or outbound, it will define the degree of openness by how much the participants are involved in both inbound and outbound OI activities. Thus, participants that practise both inbound and outbound are on a higher spectrum of adoption, and participants that practice either of them are on the lower spectrum, as can be seen from Table 5.1. In total, participants were asked to select from the list of 22 practices, which includes both inbound and outbound practices, in the email that was sent along with the consent forms. It is important to note that since this study represents the individual perspective, the practices selected by the participants represent the ones they are aware of rather than the ones that their organisations are engaged in. In other words, organisations as a whole might be practising both inbound and outbound open innovation practices, but the participants and their teams

might be only dealing with one of them. Especially this might be the case with large organisations as it is not feasible for the participants to be aware of every single open innovation activity that their organisation practises. The comprehensive list of practices and a detailed overview of what practices each participant is involved in can be found in Appendix D of this study. The practices used in this study were applied as per Stanko et al. (2017) and Mazzola et al. (2012) lists. Thus, the list of practices used in this study includes:

a) Inbound open innovation: in-licensing, institutional collaboration, purchasing of scientific services, venture capital, acquisition, beta testing, contracting/outsourcing, crowdsourcing/ideation, innovation contests, lead users, open search, supplier integration, third-party intermediaries, toolkits, university partnerships, user communities;
b) Outbound open innovation: innovation providers, IP out-licensing, spinoffs, divest, supply of scientific services, external technology commercialisation.

In addition to the practices outlined above, the participants also identified a few practices of their own, i.e., service providers (P2; P8) and creative partnerships (P19) for inbound open innovation. This study also included open source as a type of inbound open innovation, since it has been analysed as open innovation by scholars and it has been identified by one of the participants in this study (P9). This made the final list of practices N=25, as can be seen from Table 5.1.

Table 5.1 provides an overview of the participants and their degree of adoption as discussed above. As can be seen from Table 5.1 the total number of participants is 22. The majority of the participants have senior positions in the organisations they represent, varying from senior managers to CEOs and co-founders, with the average years of experience being 14. As for the industries represented, it is interesting to note that almost each of the traditional industries presented in Table 2.5 is accompanied by the smaller tech companies, for example, Education as an example of traditional industry and EdTech as an example of a technology industry. The data sample also contains the Advertising and Marketing industry (N=6, including MarkTech), which is not widely represented in the open innovation research domain. This could provide some valuable findings for professionals who represent the marketing sector. As can be seen from Table 5.1, this study chose enterprises by business size according to the classification provided by the OECD, because this study targets participants globally rather than in one particular region or country. Thus, the split is equal between large (N=11) and

SMEs/small (N=11) organisations. The last column in Table 5.1 is the current location of the participants. This data is valuable for this study as it helps to identify whether international experience as the individual level factor impacts the adoption of the open innovation practices as management innovation. Overall, and as is shown in Table 5.1, seven participants are currently based in the United Kingdom, whereas 12 participants represent the APAC region (Hong Kong, Singapore and Japan). The latter point is in line with current research calls to expand the open innovation research to the Asian region (more on this in chapters 6 and 7). The remaining three participants are currently based in Kazakhstan, India and Colombia, all representing developing countries, which is also an overlooked topic in the open and management innovation literature.

Table 5.1. Participants and their degree of adoption

Participant	Degree of Adoption (N=25)	Position	Years of Experience	Industry	Size (OECD)	Current location
P1	Low	Senior Marketing Manager	10	Technology	Large	United Kingdom
P2	High	Marketing and Digital Director	10	Advertising and Marketing	Large	Hong Kong
P3	High	Founder	10	PropTech	Small	Hong Kong
P4	Low	Vice President	18	Education	Small	Hong Kong
P5	Low	Investment Manager	10	Investment Management	SMEs	United Kingdom
P6	High	Head of Product and Marketing	18	Cryptocurrency	SMEs	Japan
P7	Low	Regional Vice President for Digital	16	Hospitality	Large	Hong Kong
P8	High	Co-founder	13	RegTech	Small	United Kingdom
P9	High	Co-founder and CEO	30	EdTech	Small	Hong Kong
P10	High	Co-founder and CEO	13	PropTech	Small	Hong Kong
P11	Low	Head of Digital	17	FinTech	Large	United Kingdom

P12	High	Head of R&D	28	Advertising and Marketing	Large	Singapore
P13	Low	Marketing Director	12	Advertising and Marketing	Small	United Kingdom
P14	Low	Senior Business Director	10	Reinsurance	Large	Hong Kong
P15	High	General Manager	22	Technology	Large	Hong Kong
P16	High	Regional Vice President for Digital Strategy	10	MarkTech	Large	United Kingdom
P17	Low	Senior Academic Manager	10	Education	Large	Kazakhstan
P18	High	Open Innovation Manager	11	IT Services	Large	India
P19	High	Co-Founder and Exec director	23	MarkTech	Small	Singapore
P20	Low	Corporate Projects Manager	16	Commodities Trading and Investment	Large	Hong Kong
P21	High	Head of Digital	12	Media	SMEs	Colombia
P22	High	Senior Director for Digital	10	Marketing and Advertising	SMEs	United Kingdom

5.3 TYPOLOGY OF THE OPEN INNOVATION PRACTICES: MANAGEMENT INNOVATION PERSPECTIVE

In section 2.2.3.1 of chapter 2 we presented two typologies of management innovation. The first one was developed by Damanpour and Aravind (2012), whereas the second one was

created by Gebauer et al. (2017)[2]. In this section of this chapter we will compare the results obtained against the typology developed by Gebauer et al. (2017) and explore whether the open innovation cases used in this study can be generated and adopted the same way as management innovation as per Gebauer et al. (2017). The rationale behind choosing the typology developed by Gebauer er al. (2017) lies in the fact that the aforementioned authors created a list of typologies based on empirical findings, and as such, during the data analysis stage more similarities were found with Gebauer et al.'s (2017) typology rather than with Damanpour and Aravind's (2012). The qualitative data analysis to identify the OI typologies was carried out based on the data obtained from the first part of the interviews, where participants were invited to talk about the operationalisation of management innovation, open innovation and the benefits of the adoption of open innovation in their organisations, as described in section 4.4.4 of chapter 4 of this study.

Figure 5.1 illustrates the classification of the participants based on their relevance to each of the typologies identified by Gebauer et al. (2017). To recap, Gebauer et al. (2017) derived 4 types of management innovation based on the results obtained through case studies. These 4 types are as follows: *efficiency-driven management innovation; externally-recommended management innovation; problem-driven management innovation; opportunity-oriented management innovation.* For more information on these types please see section 2.2.3.1 of chapter 2 of this study.

As can be seen from the figure 5.1, as a result of the qualitative data analysis, this study identified 4 types of open innovation as management innovation.

These are:

1. Externally-recommended OI as MI applied by P4 and P17;
2. Efficiency-driven OI as MI applied by P1, P2, P5, P7, P11-P14, P20, and P21;
3. Opportunity-oriented OI as MI applied by P8-P10, P15, and P19;

In addition to that, we also identified a mixed type of OI as MI, which is:

[2] This study does not take into account the typology developed by Mol and Birkinshaw (2014) in their paper since this only focuses on the external sources of knowledge, whereas in our study we focus on inbound and outbound OI.

4. Efficiency-driven and Opportunity- oriented OI as MI applied by P3, P6, P16, P18 and P22.

Thus, the only type that was not identified as per Gebauer et al. (2017) is problem-oriented management innovation. Each of the types identified, though, will be discussed below.

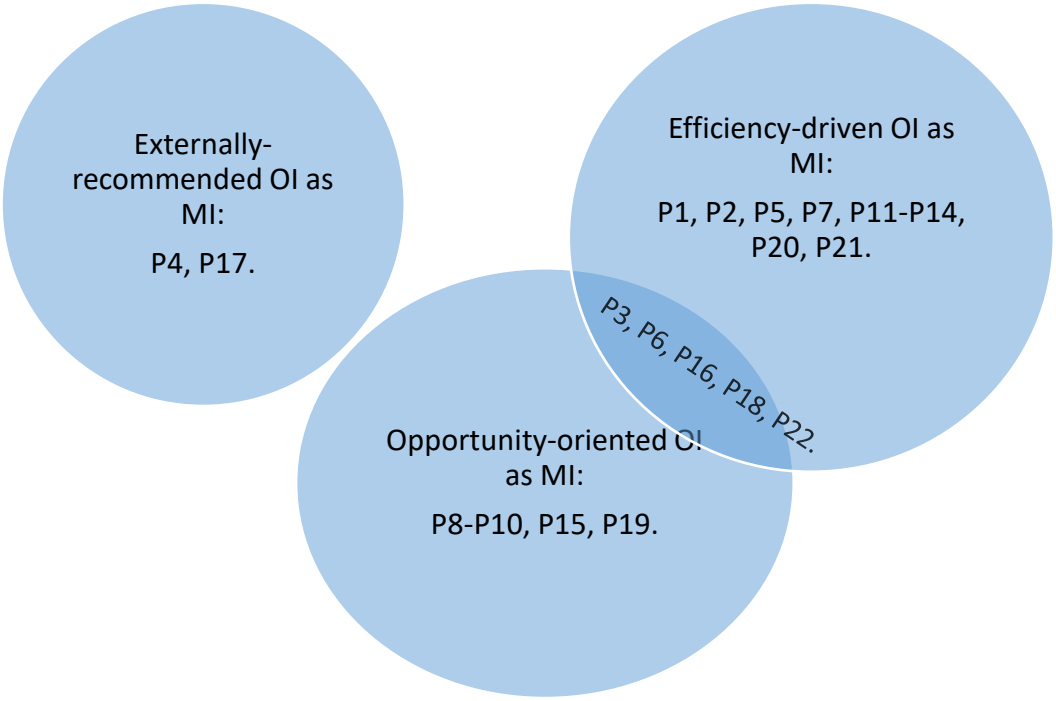


Figure 5.1. Typology of OI as MI based on the qualitative findings

Externally-recommended OI as MI

In total, for this type of management innovation we were able to identify only two cases, P4 and P17. An interesting observation from these two participants is that both of them are involved in institutional collaborations and university partnerships, i.e., inbound OI. According to Gebauer et al. (2017), the distinctive feature of externally-recommended MI is that they are normally proposed by external change agents, who play a key role in driving changes. Similarly in our study we were able to observe that both participants were approached by external agents. However, while P4 and their organisation evaluates which proposals to accept depending on their budget and the risks involved, P17 used the external proposals as an opportunity to establish themselves on the market. For example, P4 stated:

"What tends to happen is right now, we're not a big company. We're not looking to expand too quickly, but we get a lot of business proposals. So what we tend to do with most of what we're given, basically we look at what comes to us. So recently lots of new partnerships came up, so we're reviewing them. We discuss them, we vote on them. We've got four directors. So we vote. It's quite democratic."

In contrast, P17 said:

"Because our institution was created 10 years ago and was quite new, and we didn't have any experience of doing a lot of projects and opening up. So that's why university was relying mostly on working with, other institutions, other companies to build the university and to actually, to provide the high-quality standards. So, the university and actually still using it to improve generally across all the areas probably."

These two statements demonstrate how the adoption of OI as MI happens under different socioeconomic conditions. Firstly, P17 represents a developing economy (Kazakhstan) and their organisation has less experience in exposing itself to external collaborations, so they rely on the expertise and recommendations of their external partners. For P17 it is important to build external collaborations with their Western partners (mostly with the USA) as they need to gain experience and establish their reputation. Secondly, P4 comes from a developed economy (Hong Kong) and their organisation has been on the market for a while. As such, it is quite a well-established organisation and in their case the adoption of the OI practices is rather seen as a business strategy.

Efficiency-driven OI as MI

In total, 10 participants in our study adopt the OI practices as MI as an efficiency-driven type, as can be seen from Figure 5.1. An interesting observation among this group of participants is that they predominantly represent large organisations (P1, P2, P5, P7, P11-P14, P20, and P21), followed by SMEs (P5, P21) and small ones (P13). According to Gebauer et al. (2017), the distinctive feature of this type of MI is that the need for change is recognised by internal agents, who then seek external agents who will help them to drive the adoption. Additionally, employees need to acknowledge that the change is needed, after which top management will be able to drive the adoption. This explains the presence of large companies in this group,

since organisations of this size have many employees and the adoption process can take longer.

In our study there was a common consensus among this group of participants that the reason they or their top management have applied the OI practices is to address the challenges and inefficiencies in their current workplace. Furthermore, the participants in this group mostly cited inbound open innovation practices rather than outbound, in particular, such practices as beta-testing, outsourcing/contracting. This does not, however, mean that the participants in this group do not practise outbound practices, but when talking about the benefits they preferred to focus on the inbound practices only. For example, P2 said:

> *"Usually the things we do are done for a reason and there are usually benefits behind those reasons. I've already mentioned about beta-testing with regards to making our work more efficient, making our employees more productive, by helping them to cut time on unnecessary tasks or repetitive tasks. A lot of the tools and products that we integrate from third party suppliers help us do a lot of that. And ultimately it helps by cutting down time and making people more productive. It also helps us cut costs because we need less employees to do the same amount of tasks and as a result that means that we can also charge our clients less fees for the services that we deliver. All around, it helps everyone kind of benefit."*

This statement by P2 offers clear evidence on how certain inbound OI practices emerge from the need to address inefficiencies in big organisations and how this adoption drives changes in managerial routines, which is a common attribute of MI.

Opportunity-oriented OI as MI

Based on the qualitative data analysis, 5 participants were identified under this typology, as can be seen from Figure 5.1. Three interesting observations can be noticed in this group. Firstly, the majority of the participants represent small start-ups (P8, P9, P10, and P19), followed by the participant from a large organisation (P15). Secondly, all the participants that represent small start-ups are co-founders or CEOs. Thirdly, all the participants in this group practice the outbound open innovation. According to Gebauer et al. (2017), this type of MI is driven when internal and external change agents come together to create an opportunity rather than address a challenge. Innovations that are created under this type are created in a symbiosis between external and internal change agents in such a way that external change agents assist internal change agents in a problem-search process. With regard to our data

sample, it was noticeable that the motivation to adopt an outbound OI in this scenario came from screening the external environment and identifying where a business opportunity might lie. External change agents in this case are not only partners, but it is industry, consumers, shareholders and partners that are outside of organisational boundaries. An outbound OI practice that the participants decided to adopt is mostly a product or IP for external commercialisations or out-licensing. For instance P10 explained:

> *"So I guess under this, like our crowdsourcing model, right, collaboration with other companies would also fall under this. So actually, so for us, I guess what is one key thing, which I think is innovative and especially in the real estate industry is that we crowdsource data from multiple companies, external parties, and real estate. What we've done with some other companies is formed like some small focus group or group of users who are ready to be like the ones who would test out the product. Essentially say whether they think it would be good for the rest of the company. So I think these kinds of practices worked quite well for us as well. I think for us being like a data company we need like that kind of collaboration and also talking about potential partnerships further down the line. It's something that you need because often firms have their own like specialty. So it's, you know, it's impossible to collect data on every kind of aspect and every kind of area and every market."*

The statement offered by P10 demonstrates how opportunity-oriented open innovation practices emerge. In the case of P10 their industry (real estate) is quite behind in innovating, so P10 saw this is an opportunity to create a change. By collaborating with like-minded peers and listening to external conversations on their market, they were able to adopt a crowdsourcing model to replace the traditional data collection method in their organisation. The adoption of crowdsourcing OI facilitated the creation of a crowd based product that P10 offers for external commercialisation to other companies and institutions. This suggests that the application of the outbound OI practices is driven by opportunities to address gaps that exist in various industries.

Efficiency-driven and Opportunity-oriented OI as MI

As can be seen from Figure 5.1, five participants were classified within this typology. This typology was not identified in the original study by Gebauer et al. (2017). The reason behind creating this typology in our study is because, unlike Gebauer et al. (2017)'s study, in our

study the focus was on multiple open innovation practices rather than a certain type of management innovation practice. Thus, some participants in our study shared characteristics of both types of MI. These are P3, P6, P16, P18, and P22. An interesting observation among this group of participants is that there is an equal split between large organisations (P16 and P18), SMEs (P6 and P22), and with P3 representing a PropTech start-up. Furthermore, the participants in this group identified both inbound and outbound types of OI, but with regard to outbound they also adopted it to address inefficiencies. Thus, from the one side such an adoption is driven by the opportunities available, from the other side it is done to address the existing inefficiencies. On this note, P22 stated:

> *"So when we speak about out licensing, I mean in-house is being taken is one of the examples because your resource becomes so much less, you're not effectively hiring a team to manage activity for the client to manage their marketing needs. You just consult, you need significantly less people, but you're charging a very significant fee for it. So it's profitable a hundred percent, that on a sort of very tangible benefit. And on intangibles, I think it's an interesting work for people. So it's a development for the people who actually take this opportunity."*

This example offered by P22 suggests two points. From the one side, under the current economic crisis in the UK their company needs to come up with solutions on how to run their marketing activities with external partners effectively by helping their client in bringing marketing teams in-house, i.e., out licensing the way of work. From the other side, the application of these outbound OI practices created challenges for those professionals inside their organisation who used to work with the external collaborators, so these professionals have to go through a transformation of their responsibilities.

To sum up, this section has provided a classification of the OI practices based on MI typology and demonstrated how the adoption of OI practices happens under different circumstances. In other words, the results obtained suggest that the application of the inbound OI practices is an efficiency-driven MI, whereas the application of the outbound OI practices is an opportunity-oriented MI.

The next sections of this chapter will focus on presenting the results obtained for the TOEI-MI framework and, in particular, what factors impact on the adoption of the OI practices as MI. It is important to note that the subsequent sections of this chapter will not focus on

presenting the results based on the typology developed here. Rather it will look at each case separately and provide comparisons where needed.

5.4 FACTORS THAT IMPACT ON THE ADOPTION OF OPEN INNOVATION PRACTICES

One of the main objectives of this study is to understand what factors facilitate the adoption of open innovation practices as management innovation within the TOEI framework. Thus, Table 5.2 provides an overview of the findings obtained during the semi-structured interviews. New factors that were found during the data collection and analysis stage are marked with an asterisk. These new factors are the reputation of external partnerships, the global situation 2019/2020 and intrinsic/extrinsic motivation. Reputation as a factor has been identified in two contexts: technological and environmental, i.e., multilevel. From the one side, the reputation of the external partners matters for their adoption, from the other side the participants do not want to be associated with bad players as this can impact on their reputation and put them under professional pressure. This is also supported by the cluster analysis (refer to section 5.6.3 of this chapter). As for the global situation 2019/2020, this factor has been identified within the environmental context, whereas intrinsic/extrinsic motivations were within the individual context.

In general the findings of this study are as follows. The technological and organisational contexts were fully supported by the vast majority of the participants, whereas environmental and individual ones were only supported across certain factors. In particular, within the environmental context the participants rejected the idea that the adoption of open innovation practices as management innovation is a management fashion. Nor do they adopt it to imitate their competitors. Similarly, industry as an external factor was rejected. As for the individual context, managerial tenure has not been found to be a significant factor when it comes to the adoption of open innovation practices as management innovation, whereas international experience and self-directed learning were found to be significant by the majority of our participants.

Table 5.2. Summary of findings for TOEI-MI contexts

Context	Factors	Supported	Supported by (N=22)
Technological	Relative Advantage	Supported	P1-P22
	Compatibility	Supported	P1,P2, P4, P5, P7-P19, P21, P22
	Complexity	Supported	P1-P6, P8-P22
	Triallability	Supported	P1-P7, P9-P12, P14-P17, P20-P22
	Reputation of external partnerships*	Supported	P2, P4, P5, P10-P13, P15-P18
Organisational	Size	Supported	P1, P3-P5, P7-P22
	Top Management Support	Supported	P1-P22
	Organisational Culture	Supported	P1, P3-P22
Environmental	Industry	Not Supported	P6, P9, P12-P14, P16, P18
	Fashion Setters	Not Supported	P8, P9, P11, P13-P16, P18, P21
	Mimetic Pressure	Not Supported	P2, P3, P11, P13, P17
	Normative Pressure	Supported	P1, P3-P5, P8, P10-P15, P17, P21
	Coercive Pressure	Supported	P1-P9, P11, P12, P14, P18, P19, P21, P22
	Global Situation 2019/2020*	Supported	P4; P7-P11; P17- P22
	Reputation of external partnerships*	Supported	P2, P4, P5, P10-P13, P15-P18
Individual	Managerial Tenure	Not Supported	P8, P9, P11, P13, P14, P17-P21
	Cosmopolitanism/International Experience	Supported	P2-P9, P12, P14-P16, P19-P22
	Self-directed learning	Supported	P1-P4, P6, P8, P10, P11, P13-P22
	Extrinsic and Intrinsic Motivation*	Supported	P1, P2, P7-P17, P19-P22

5.4.1 TECHNOLOGICAL

The following four factors were chosen to analyse the perceptual characteristics of open innovation practices that impact on their adoption. All four factors have been supported by

the majority of the participants. Additionally, a new factor, the reputation of external partnerships, e.g., third party intermediaries, external suppliers, has been discovered.

Relative advantage

Innovations that are perceived to be better than older ideas demonstrate higher rates of adoption (Rogers, 1995). As such, the relative advantage that comes with the adoption of the open innovation practices was supported by all the participants (P1-P22). From the individual perspective one of the main advantages that was noted by the participants is time impact. This advantage was widely discussed by P1, P3, P4, P6-P8, P13, P16, P18, P19, and P21. In particular, this was observable among those participants who are actively engaged in beta-testing, a type of inbound open innovation (P1, P7, P16, and P21). On this note, P21 stated:

> *"I think the advantage is that one of the changes, the big changes has been the time, the release time of any project has changed radically because we would, before we used to do things, they always wait until it was perfect and we wouldn't launch anything. Right now we try we launch things on different stages and in a more escalated way through beta-testing. So we, we have been able to do a lot of things faster than before. I will say they're time impact."*

This reoccurring pattern suggests two things. Firstly, the adoption of certain open innovation practices reduces the risks that would occur in old models, which in turn creates time and room for further improvements. Secondly, and most importantly from the individual perspective, once there is less control over mistakes, individuals are able to dedicate time that they did not have before to focus on other tasks and build core competencies. Altogether this emphasizes changes in management processes since it highlights the shift from traditional daily processes. Additionally, the adoption of open innovation practices leads to changes in responsibilities allocated among employees due to more time being available. This point was made by P22:

> *"…our internal teams have a different, development lines, so they could focus on product, they could focus on delivering something unique rather than doing repetitive tasks. And that's what keeps people in the company. It lowers the amount of talent we could potentially lose to some competitors. And I think that's a very key advantage of it."*

This implies that the adoption of open innovation not only brings changes in management practices and processes, but also in organisational structures as employees gradually go through role transitioning. Both changes in the management process and organisational structures are distinctive features that differentiate management innovation from other types of managerial ideas and practices, as was discussed in section 2.2.3 of chapter 2 of this study.

Compatibility

Innovations that are perceived to be in line with organisational values and experiences are more likely to be adopted (Rogers, 1995). In regard to the adoption of open innovation practices the majority of the participants found compatibility to be an important factor that facilitates the adoption process (P1, P2, P4, P5, P17-P19, P21, and P22). When talking about the compatibility of the open innovation practices, the participants mostly linked the compatibility of the adopting practices with their organisations and personal vision. This line of thought is particularly observable among founders and co-founders in our data sample (P8, P9, P10, and P19) since they very well represent the individual perspective. For instance, P9 (EdTech/Open Source) commented:

> *"So vision is what entrepreneurs start with our, business leaders start with, so you always have your end goal, right? So this is my vision. This is where I need to get to. And how do we get there? But then you look at your options. You look at opportunities and you look at look at what's out there in the market. So I think on that note, I mean, absolutely compatibility of these practices aligns with my vision as it is my company's vision too".*

Based on this pattern the following two conclusions can be reached. Firstly, at the individual level compatibility must correspond to a personal vision of owners. Secondly, it suggests that the adoption of open innovation practices is not ad hoc, rather it is a very well planned and carried out strategy from the entrepreneurial perspective and in the majority of cases it is embedded in the organisational culture. In fact, the latter point about organisational culture and compatibility was discussed quite a few times by participants that represent other positions (P10, P12, P18, P21, and P22). On this note, P21 stated:

> *"I think it's totally compatible with our organization culture and values because these open innovation practices are very aligned with creating new ways of doing things, it's in the DNA of our company. Compatibility has been hard in terms of the Colombian culture, about sometimes time management and things like that, because*

we are very used to do things that take one year and then making things that can be done in one or three months it has been very challenging, but we have been able to work on that."

Similarly, P22 claimed the following when their organisation decided to adopt out-licensing (outbound OI) as a part of their business strategy:

"So, in terms of compatibility, we had to go through a review of culture internally to make it align with us, the old cultural values and ways of working with very stringent and very incredibly old fashioned. So, we had to introduce anything from flexible working hours, but also we introduced the special culture. So we've given people a lot of freedom (freedom to learn about IP out-licensing and how to execute it). And I think that cultural switch is, is incredibly important- without it we wouldn't be able to open innovation at all."

This revelation by those participants who do not represent the C-suite demonstrates that, although the open innovation practices are compatible and compatibility is an important factor, the adoption process itself can be quite challenging. In other words, when decisions are made at the top level (DNA=C-suite) the internal culture, which consists of ordinary employees, needs to be changed in order to accommodate new practices. This then leads to changes in management processes and organisational structures as described earlier in this section.

Complexity

Innovations that are perceived to be too complex to understand and apply are harder to adopt (Rogers, 1995). In terms of open innovation practices, ease of use can come from how much time it takes individuals to adjust to external ideas, how easy it is to align with external collaborators and others. So, complexity was found to be a significant factor among the vast majority of participants (P1-P6, P8-P22). From the individual-level perspective the participants who have senior jobs suggested that the complexity of the open innovation practices impacts on their jobs since new practices may require training their staff, which is time consuming, but quite often these are short-term complexities. This topic has been discussed by P1, P12, P14, P18 and P21. For example, P14 explained:

"I think again, there's no way other way around it, we'll have to teach our employees about the practices. Sometimes change management is tough. Like, people, employees

and especially the clients that are adopting the practices, it's tough for them to adapt, because it's human nature to resist change as well, but we have seen over a period of time when they see the benefits, they are able to adopt it more easily."

This reoccurring pattern demonstrates the importance of easiness of use, since senior level individuals need to invest time in training their subordinates to make sure that the adoption process for them is easy and understandable. Otherwise the adoption may fail among those who have to use these practices on a daily basis, e.g., P2:

"So if you implement things, when people are not ready, you know, even if there are expected benefits, the people are not ready for the change, then that might not be a success."

For individuals who represent senior level jobs this also emphasises the slight shift in their traditional job routines as they need to try a new role, although, this shift is a temporary one once the adoption has been completed. From the other side in order to address this challenge some participants in our data sample argued that complexity is an important factor, but when one has the right people in place the adoption is easier. This was brought up by P6, P8, and P13. For example, P6 suggested:

"…if you have the right people who appreciate and can articulate those practices. So the short answer is yes, I think so (re complexity and its impact). And the reason why I say that is because I think any well minded business person recognizes that they cannot do everything by themselves and they cannot do everything internally."

This suggestion made above once again emphasises the importance of having the right structure in place that will create favourable conditions for adoption. The identification of individuals who demonstrate the skills that are needed for this kind of process has to be a priority for top management. This, in turn, will help senior level managers to keep their roles and save time rather than investing it in training new staff.

Triallability

Prior experimenting with innovations is another important factor that impacts their adoption (Rogers, 1995). In regard to open innovation practices, free trials or experimenting have been found to facilitate the adoption by the majority of the participants (P1-P7, P9-P12, P14-P17,

and P20-P22). Similar to compatibility, the participants found triallability to be an important factor as it needs to be in line with the organisational goals as they are restricted with finance and do not want to run unnecessary risks. For example, P6 states:

> "*Absolutely. Because as a company of our size, if we make the wrong type of trial decision, and we choose the wrong vendor, or we overpay for things that we don't need, it could very much eat into the ability for us to have enough capital run rate, to survive as a company. So if you make the wrong decision on the partner, then you sign the wrong type of financial contract, and then suddenly you're stuck with like a three year contract for something that may or may not be something that you need".*

This reoccurring pattern among our participants suggests that for individuals who are at the frontier, the adoption is more of a strategic choice that impacts on their jobs than a personal decision. Additionally, those open innovation practices that require building human relations need to be carefully examined as, unlike technological innovations, external collaborators and partners do not always come with preset values and expectations. Thus, a long term commitment may be problematic. For instance, P17 commented on institutional collaborations:

> *"I think we try to actually first see their values and mission, how they actually, compatible with our mission and values. Is it on the same direction with us or not? So, it's really important before on the beginning stage".*

Reputation

The reputation of external partnerships, i.e., inbound open innovation practice, has been identified as one of the factors that either facilitates or hinders the adoption of open innovation practices. In particular, this topic was discussed more often by those participants who represent large organisations rather than small ones. Thus, in total eleven participants recognised this factor as an important one; with P2, P11, P12, and P15-P18 coming from large organisations and P4, P5, P10, and P13 from SMEs/small organisations. This finding can be explained in the following ways. Firstly, a high number of inbound open innovation practices constitute human aspects (unlike technological innovations), and as such, it may take time and effort to build trust, e.g., vendors, third party intermediaries, institutional

partnerships and others. On this note, P4, whose organisation has just introduced institutional collaborations in the USA and China, stated the following:

> *"Reputation is very important. I mean, they, they care a lot about honour and ethics. When we look at a new partnership with anybody, it comes down to that. So sometimes we have quite high standards, which can make it difficult sometimes. So, we recently had to diversify our business outside of China, for example, because we want to expand our operations in the USA. "*

This revelation suggests that the reputation of external partnerships can be seen as a factor that impedes adoption when it comes to the decision making process. From this perspective, reputation is considered as a technological factor of open innovation, i.e., innovation characteristics.

Secondly, not only does the reputation of external partnerships impact their adoption, but it is also an important external factor that will impact the adopting party. In other words, organisations that adopt these practices do not want to be associated with bad actors as this can impact their own name. From this perspective, reputation is seen as an external factor and it explains why this factor was identified more often by the participants from large organisations, because unlike small organisations large organisations are more likely to be under normative and coercive pressures that impact their decisions. For example, P17 suggested:

> *"First, thing it's expertise. The expertise of those institutions, our collaborators, so their expertise in their field, their ranking in that field, how they, and also, I think their name, I mean their name, that they are respected in their field. So it makes us also look good, because we were a newly created institution."*

Thus, this shows how large organisations consider the reputation of external partnerships as an important external factor, because they experience a certain pressure from their own network. To sum up, reputation in this study is found to be a multi-level factor. From the one side, its technological/ innovation characteristics matter, from the other side it also plays the role of an external factor as it impacts on the professional image.

5.4.2 ORGANISATIONAL

The organisational context of this study represents the original TOE framework as well as the cultural perspective of management innovations, and three factors were analysed within this

context. All the following factors were shown to be significant for the adoption of open innovation practices by a large number of participants.

Size

In this study the size of the company, in terms of the number of employees, has been shown to be an important factor that impacts on the adoption of open innovation practices as a form of management innovation. Although in our data sample there was an equal split between the participants that represent large and small companies (11/11), there was a consensus among an overwhelming majority of the participants that the smaller the size, the easier the adoption of open innovation practices. This topic was brought up by P1, P3, P4, P7-P19, P21, and P22, although some of these participants represent large organisations. However, the reason they thought a smaller size makes adoption easier is because it comes from their personal working experience, i.e., the individual perspective. Especially, this individual level pattern was observable among CEOs and co-founders (P3, P8-P10, and P19). On this note, P8 stated:

> *"I think other companies (companies' names removed for confidentiality reasons), and the bigger company gets definitely the more red tape than becomes introduced. I think the difficulty is what then ends up happening is that people that are far away from the detail and the time to make these decisions. There's always a break in between where, you know, somebody at the top might say that they want X, Y, and Z, but they've got no idea what it actually means for the people on the ground that will, for example, be managing that particular process or documents of that decision."*

This statement of P8 provides evidence on the importance of organisational size to individuals who have to engage in the adoption process rather than those who make decisions. This, however, does not mean that a large size should be seen as a barrier. On the contrary, some participants acknowledged that the adoption of certain open innovation practices is contingent upon organisational size. In other words, some open innovation practices are fit for smaller organisations, whereas the others are possible to be implemented in larger organisations due to the budget and resources available. For instance, P13 suggested:

> *"Size would certainly impact them in, in a certain way. For supplier integration, we don't do it often because we are a smaller team and because of the process required to, you know, investigate, and research on suppliers and all of that stuff that I've*

mentioned before. Again, time is limited for each individual. So, it does impact the speed in which we can look into supply integration."

This suggests that in small organisations individuals that engage in the adoption process may feel under pressure as they do not have enough resources and time to carefully examine which practices to adopt, which in turn will impact their work routines due to time restrictions. Thus, from the perspective of allocating resources in small organisations when it comes to adoption, a small size can be seen as a challenge as one person has to fit many roles. On this note, P9 stated:

"So you, you almost have to be like a person with ten hands, like be able to digest research to adopt those open source technologies, if they can speed up your time to market or, or save your resources."

Top Management Support

Top management support was found to be significant by all the participants of this study. In regard to its correlation to the adoption of open innovation practices there are two distinctive topics that emerged during the data analysis. From the one side, some participants noted that top management support directly impacts the adoption decision. From the other side it emerged that top management support has to be embedded in organisational culture. The former topic was discussed by P1, P2, P4-P6, and P12-P14. In this case individuals do not have much say in the adoption decision nor did they share any sentiments how it makes them feel, since adoption is a part of the TMS vision. On this note, P1 stated:

"For example, for beta testing it's also the organization's view. How do they see the product launches, how risk averse they are and how worried they are about their innovation confidentiality as well. So those are the few things that will impact the beta testing decision within an organization. So it is also very much the leadership decision on how protective they are of their data, how protective they are of their services or the product."

On the other hand, participants (P3; P7-P11; P15-P22) suggested that in their cases top management support is embedded in organisational culture. An interesting point among this group of participants lies in the fact that this group is dominated by CEOs and co-founders (P3, P8, P9, P10, and P10), all of whom agreed on the importance of being open-minded and having a flat-structure. For instance, P9 explained:

"Oh, I mean, in fact, we have a very open system in that regard, so, I mean, we have our meetings and, and everyone has a view and everyone has a vote. So then later it's, if, if someone feels very strongly about something and open source or, or any other issue, then that person is to convince the others, that this is the best, best decision for the firm. I mean, I have had more than enough times, where my decision would be thrown away by the team and it's perfectly okay."

This suggestion demonstrates that having an open minded TMS is important, because it gives lower rank employees a chance to express themselves and perhaps to invest more time in self-learning and independent thinking. This is especially evident when it comes to employees who engage in open practices. On this note, P16:

"We are given autonomy in sense of, I have my budget, I have my team, I have to achieve a result, and this is my target. My goal is, and I can do what I need to achieve them. So, I think that type of top management style has helped us because it means that I don't have to go through as many hoops in order to kind of go in and do what I need to do if that makes sense. But yeah, I think top management support is very helpful in these open processes."

This statement supports the previous point about having a flat structure and highlights its importance for two reasons. Firstly, an open style top management support facilitates independence and dedication from employees. Secondly, employees who feel dedicated will achieve more targets, which in turn will be beneficial for their organisation.

Organisational Culture

Organisational culture represents the cultural perspective of the management innovation literature and it was supported by the vast majority of the participants apart from P2, who did not provide any specific reasons on why culture does not impact the adoption in their organisation. The results obtained for organisational culture somehow resemble those obtained for top management support with a few exceptions. In other words, as stated by participants on the role of top management support, an organisational culture that facilitates the adoption of OI as MI is closely tied to how TMS views the adoption process, a decision of one person vs a decision that considers the views of others. With regard to the former group, participants agreed that in their organisations culture is traditional and conservative, although it is slowly changing. This was discussed by (P1; P4; P10; P17; P18). For example, P4 on institutional collaborations and partnerships:

> *"There's a certain conservatism amongst the cofounders to change a lot of, lots of things. And that's been a battle, but they've got better over the time. We had to sort of go completely different strategy sometimes. And it's, and it's been better. We've diversified the business outside of China, for example, which you might not have done before."*

This demonstrates that conservative or traditional organisational cultures can be seen as a challenge for the adoption of open innovation, because as its name suggests to become open one must have an open mind-set towards what is unknown and foreign. In other words, the adoption of open practices requires changes in managerial structures or traditional managerial structures have to change in order to accommodate external knowledge (institutional partnerships in this case).

Participants (P3, P5, P7-P9, P11-P16, and P19-P22) explained that in their cases the organisational culture is very open, lean, agile, which makes adoption easier. For instance, P19 on their organisation adopting IP out-licensing:

> *"I think that's why we've come up with a lot of new things for the last six months, more than ever (re organisational culture). The culture for us is very stark staff culture. It's just very linear in there. There's no nothing. There's no red tape. We empower employees to manage their own decisions, there is no right or wrong if you don't know when you're making a mistake. We learn from the mistakes. That's how we progress."*

This common topic on open culture highlights the importance of open culture for the adoption of open practices for individuals, because it empowers individuals, and makes them feel more involved and eager to learn.

5.4.3 ENVIRONMENTAL

In order to assess how the external environment impacts on the adoption of open innovation practices the following five factors, as part of the original TOE framework, as well as the fashion and institutional perspectives on management innovations, were selected for analysis. Three factors- *industry, fashion setters, and mimetic pressure* were rejected; two factors- *normative* and *coercive pressure* were supported by the majority of the participants. Additionally, a new factor (Global situation 2019/2020) was discovered during the interviews. Reputation was discovered to be a multilevel factor, as discussed above. Its

environmental relationship will be discussed later in this chapter when presenting the results of the text-mining analysis.

Industry

In the open innovation literature and general innovation adoption literature industry is considered to be one of the most obvious and studied external factors that impacts on the adoption process (as discussed in chapter 3 of this thesis). Yet, our results did not support this claim. In other words, the majority of our participants could not explicitly identify the impact of the industry or found it rather negative (P1-P5; P7; P8; P10; P11; P15; P17; P19-P22). Only seven participants (P6; P9; P12; P13; P14; P16; and P18) from our data sample were able to agree that industry has an impact.

One of the main reasons highlighted by those who rejected industry as a facilitating factor was the lack of innovation in the industries, which forces them to go against the tide, as well as general idleness and slowness to react. This was an important point highlighted by P3, P4, P8, P10, P17, P20, and P21. For example, P3 states:

> *"I mean, it's hard. Problem is because we work with the very non innovative industry. So, real estate is 20 years behind. Funny enough, insurance was the first industry to use data, you know, to do model pies. But now they are well behind everyone how to use data and everything. So, our industry is not under pressure to innovate. Every time we show them innovations, we need to explain them how important it is for them. Let's say outsourcing, for example, it's not something that they do easily. That's not something that change their mind-sets. With licensing again, you know, it is not in the picture. So actually I think, industry is almost like a negative impact to."*

Although industry is a negative factor, from the individual perspective the results reveal that this can become a motivation to go against popular opinion and established norms. For instance, P10, who adopted crowdsourcing to replace traditional data collection methods, suggests:

> *"I think otherwise you're not going to really be able to innovate. I think what you see in a lot of industries is like, when people try to do things differently, there's always that kind of you know, industry pressure. So actually for me, that can kind of situation is turn [sic] on to do the thing, if you know what I mean, because, everyone says I'm*

doing something wrong, but it looks like I'm making progress- not wrong or crazy or stupid. So that maybe means I'm doing something that could kind of change the way things are done."

This common pattern suggests that those individuals who find themselves in non-innovative and slow industries feel challenged and motivated to create a change, which results in new ventures that disrupt traditional industries and potentially become a benchmark for others. Additionally, these non-innovative industries are led by the early-adopters of the open innovation practices in the case of our study. It can also be said that these early adopters are intrinsically motivated to bring about change. For example, both P3 and P10 represent PropTech, whereas P17 and P20 are trying to become flagmen among their peers, since their industries do not demonstrate much progress. The adoption of open innovation practices helps them to become global (e.g., institutional collaborations for P4 and P17) and bring change to their industries (P3 and P10 as PropTech).

On the other hand, those who supported industry as a factor (P6; P9; P12; P13; P14; P16; and P18) pointed out that the industry for them is not just organisations similar to theirs, but it goes beyond it. In other words, it is the system of customers, regulating bodies and others that push them to stay competitive. For example, P9 on the adoption of open-source:

"Absolutely. Industry meaning the buyers, the users, the parents. As you know, it's like you spend only a few seconds and if the interface is not, not attractive, if the payment is not easy, if the subject is not interested, you are not going to pay you, you just go to the next site. Right. So as a company, we need to be prepared for that and have the right system, the right story, the right product. And, the right price point."

This support of industry as a factor suggests that the participants who represent this group of adopters feel stable, secure and do not feel challenged by the external factors. For them the rationale behind adopting these open innovation practices is linked to competitive advantage rather than becoming disruptors among their peers.

Fashion Setters

Within the context of the TOEI framework in this study fashion setters represent the fashion perspective on management innovation. Thus, participants were asked whether they think that the adoption of OI as MI happens under the influence of professional gurus, consultants,

specialised exhibitions etc. In our study fashion setters as a factor was not found to be significant, i.e., the adoption of open innovation is not a fashion. Those participants who found its impact to be neutral (P2, P5, and P17) agreed that they are not in a position to answer this question as they do not possess enough knowledge or they cannot observe a direct correlation. For example, P17 states:

> *"I'm not sure I can answer for this question. Some of them (institutional partnerships), probably our partners came from those kind of conferences etc., but I don't know exactly."*

This pattern among those who found the impact neutral suggests that the adoption of open innovation is rather a strategic choice than a trend and the decision to adopt it is taken at the senior level. This line of thought is also supported by that group of participants who rejected fashion setters as a facilitating factor (P1, P3, P4, P6, P7, P10, P12, P19, P20, and P22). In this group, five participants (P1, P4, P7, P20, and P22) stressed that the reason behind the adoption rather lies in the relative advantage that comes with it. It is interesting to note that in this group the majority of the participants have senior positions (P1, P4, P7, and P22) unlike those who found its impact neutral (mostly managers apart from P2). For example, P22 suggests:

> *"The primary factor will always be the need for either internal organization to streamline internal processes, make a cost efficient, like resource more efficient as an examples [sic], and our clients' needs, what are we delivering for the client?"*

Furthermore, in the group of those who rejected fashion setters as a factor we can observe a strong negative reaction from CEOs, founders and co-founders (P3, P10, and P19). The most common reason cited by those who rejected the idea in this group was the fact that usually fashion setters are not helpful other than in networking, they possess limited knowledge or their industries are dominated by bad actors none of whom they want to be associated with. On this note, P3 states:

> "*Definitely for me, no. I mean, I've been to so many of these innovation conferences. I think what has more impact is professional meetings. A group, you know, where founders of company meet like networking thing between companies founders. Knowing how those are start-ups or the guy out there doing has more impact for me than fashion setters. The problem of these conferences is that the most of the times*

they are sponsored. Each time you go to, in London there are lots of AI conferences, so it does not really feel as legit."

Altogether with regard to fashion setters, our findings suggest that the adoption of OI as MI happens in a top-down manner with consideration of what is best for their organisations rather than what is trending. In other words, C-suite makes a strategic decision, vice presidents and directors adopt this decision as a part of their strategy and diffuse it among their managers, who engage with it on a daily basis.

Mimetic Pressure

Mimetic pressure is an institutional mechanism and describes the organisational behaviour in which organisations imitate their competitors' practices during times of uncertainties, and when competitors are more successful. In accordance with the results obtained, the majority of participants (P1, P4-P10, P12, P15, P16, and P18-P22) stated that they do not adopt open innovation practices to imitate their competitors. One of the main topics highlighted by this group of participants was the fact that they adopt the open innovation practices to distinguish themselves from others, to strengthen their DNA and empower their vision. This topic was explicitly cited by P8, P9, P12, P15, P21 and P22. On this note, P9 on the adoption of open source and other open innovation practices:

"I think every company every company needs have its own DNA, I mean, if you cannot create a differentiator, I think it's very hard to really stand out. Now it's not always true, but in most cases it's true. So I think I will not call it mimic, but I would say, you know, it is open innovation. So at the end of the day, it needs to have your DNA."

The focus on being different and creating their own DNA demonstrates that the participants in this group see OI practices as the way to create new opportunities and differentiate themselves from other players on the market in the long-run, which once again demonstrates why open innovation is not a management fashion. This, however, does not mean that participants never look at their competitors. On the contrary, some of our participants in this group confirmed that it is important to be aware of your competition as there is always a pressure that has to be responded to, but imitation will lead to failure in their cases and is not an option. This was discussed by P1, P4, P6, and P16. For instance, P4 on institutional collaborations suggests:

> *"I think you're always under pressure from what your competitors do. And we watch what they do quite carefully, but I think we generally make our own decisions. I don't think we're in that situation when we follow everyone else. Because what we do, there are some people in the business who paid education agents, 50% commission on the fees. We don't do that. That's just going to bankrupt the company. So we do respond to pressure, but we don't, we tend to try. And the ultimate goal is to keep the company going."*

This assertion supports the earlier point that the adoption of OI is unique in every case and has to go in line with personal goals. Yes, participants engage in market research and learn from best practices that come from external sources, but use this as a compass to navigate what works best for them.

The most interesting reason for rejecting mimetic pressure among this group of participants was cited by those who classified themselves as early-adopters of the open innovation practices. This particularly was suggested by P10, P18, P19, and P20. In their cases there is no one to look at or follow. On the contrary, these participants become trendsetters that others may follow. For instance, P18 states:

> *"All of the competitors have not adopted open innovation to the extent that we have done. And the reason is that they are they're maturing into it. We would call ourselves in our competitive space as one of the earlier adopters of open innovation. So, we just may be slightly ahead in terms of the maturity cycle."*

Normative pressure

Normative pressure is the second institutional mechanism of this study that describes how under the ethical, moral obligations and demands that come from a professional network innovation are adopted and diffused. Unlike mimetic pressure, the results demonstrate that participants (P1, P3, P4, P8, P10, P11-P15, P17, and P21) believe that the adoption of open innovation practices in their sectors is influenced by normative regulations that come from their professional networks. One of the main topics discussed by the participants with regard to normative pressure was that this type of pressure was found to be a driver to become better and introduce best practices as far as possible. In other words, it was revealed that under the impact of normative pressure the participants keep evolving as they want to live up to the expectations of their peers. On this note, P17 stated the following with regard to adopting institutional collaborations:

"We always only do the best and implement all the good practices. So, it's expected from the society that we need to be always the best to provide the best quality education (normative pressure). So, I think this is another factor. We want to be a role model for the other universities and the others can learn from us. We can share our expertise, we can help our other universities to adopt these sorts of practices."

Similarly, P21, who represents a developing nation the same as P17, discussed the importance of societal obligations, i.e., normative pressure.

"Yes, there is a big responsibility, like social responsibility in terms of the, the way you process information and tell people, share your content with other parties, like out-license it."

This pattern among participants suggests that normative pressure is not a barrier. Rather it can be seen as a motivator that challenges certain individuals to influence their peers. Additionally, in some instances it was revealed that normative pressure matters, because it creates a conversation between an organisation and the market, and without this kind of conversation it is hard to know which steps have to be taken, what practices should be adopted. For instance, P8 on IP out-licensing stated the following:

"So we have regular conversations now with those bodies, because we want them to be aware if there's a different way to do things, here we are, we exist, and this is how big this problem, which they've all been really interested in susceptible to that. They're really keen to understand what we're doing and how. But then we also want, we need, feedback coming in from our potential customers before we'd go out to the market."

Coercive Pressure

Coercive pressure is the last institutional mechanism of this study. It represents the government and non-government regulations that either facilitate or hinder the adoption of open innovation practices. Similarly to normative pressure, the impact of this factor was supported by the overwhelming majority of the participants (P1-P9, P11, P12, P14, P18, P19, P21, and P22). Although this factor was found to be significant its impact is seen as negative as it hinders the adoption process and slows it down. In other words, participants see it as a challenge that impacts on their way of working. This topic has been particularly discussed by

all the participants in this group. For example, P3 commented about contracting and how this type of inbound OI activity impacted on their organisation:

> *"I mean for example, in the UK right now they change the law for contractors. It's a pain now to take any contractors in the UK, they are changing the tax system for them. And it has massive impact, because of all the admin work. And I met a lot of contractors in London in technology- it is a big trouble this year to find any contractors in the UK."*

On the same note, P21 highlighted how, in their opinion, in developing countries coercive pressure comes not only in the form of regulations, but also bureaucracy that impedes the adoption process. In this particular scenario the participant explained how this type of pressure impacts on their out-licensing activity (outbound). Thus, P21:

> *"Government regulation makes it harder. Definitely makes the adoption harder, because in places like Colombia there is a lot of bureaucracy involved in so many things. And because we are a media company it even impacts how we adopt these open innovation practices."*

In particular, the way coercive pressure impacts certain industries was observable among those participants who represent the marketing and advertising sector (including MarkTech). These participants (P2, P12, P19, and P22) raised a concern that new privacy laws (e.g., GDPR) are changing how their products (IP out-licensing) will be developed and adopted as they are now highly dependent on government bodies, e.g., Europe, which creates lots of challenges and obstacles. On this note, P2 suggests:

> *"We have the EU general data protection regulations, and that safeguards the data and privacy of users of European EU citizens. So, that kind of has not impacted us in Hong Kong too much, but it's more kind of impacted European companies and some of the ways of working, and data collection and how companies are using that data and particularly in marketing."*

This statement by P2 also provides evidence on how coercive pressures can unevenly impact the diffusion of the open innovation practices as management innovation across the globe in such a way that some regions can be ahead, while others are left behind. To sum up, unlike normative pressure, coercive pressure is mostly seen as a barrier for adoption.

Global situation in 2019/2020: COVID, Brexit/ economic recession, Social Movements/ BLM/ Hong Kong Protests, US and China relations

2019 and 2020 have been strongly defined by social movements in Hong Kong and the global pandemic/COVID19, as well as BREXIT and economic recession in the UK. One of the topics that was widely discussed by the participants during the interviews was the impact of at least one of these global disruptions on their decision to adopt open innovation practices. Thus, during the data analysis this factor was identified as a new one. The impact of this factor can be categorised in two groups. From the one side it accelerated the adoption of the open innovation practices, e.g., P7-P11, P19-P22. From the other side it can be seen as a barrier, e.g., P4 and P17.

In the first group of respondents an interesting pattern was observed among C-suite (P8-P10 and P19), whose adoption of the OI practices in their cases is a response to the global pandemic. On this note, P9 commented about adopting an outbound open innovation for their EdTech business:

> *"So just to give you an example (of external factors), we looked at, I mean, during the COVID, there was no travel. So we talked to our partners in China and the parents in China, and we saw that, you know, there was a frustration that people could not go out and, and everyone was bored. So we took that as a cue and we actually started that cultural journey program that you are aware of. So cultural journey was our innovation."*

This common agreement between the participants in this group and particularly among the C-suite indicates how open innovation was seen as a tool that can help to address the uncertainties associated with the global pandemic. From the perspective of founders and CEOs the adoption of OI practices is also considered as a survival strategy for smaller organisations. This adoption and creation of new value will contribute to better revenue and competitive advantage. Additionally, not only did COVID19 facilitate value creation, but it also raised a question among senior directors on how to change managerial practices in such a way that it benefits employees and their well-being. This point was highlighted by P7, P11, and P19.

On the other hand, those participants (P4 and P17) who are heavily engaged in the institutional collaborations argued that in their cases the global pandemic is seen as a barrier

as it has frozen a number of external collaborations and heavily impacted their industry. For example, P17 said:

> *"The pandemic has frozen lots of projects (institutional collaborations) we do in the USA. We had to prolong a number of contracts, put lots of projects on hold, lots of students had to stay home this year and we have to think how to organise their online learning with the USA. So, this has worsened our situation for sure".*

This suggests two things. Firstly, those who have already adopted certain OI practices are faced with a number of operational challenges under the current circumstances, in contrast to the first group, who saw the adoption as a response strategy. Secondly, from the perspective of employees this suggests a shift in roles and budgets, as under the pandemic they need to come up with new ideas on how to run these collaborations. As a result, adoption processes slow down.

5.4.4 INDIVIDUAL CONTEXT

As part of the TOEI-MI extension model as well as the rational perspective of management innovation, the following three factors were analysed in relation to the adoption of open innovation practices. *Managerial tenure* as a facilitating factor was rejected, whereas *cosmopolitanism/international experience* and *self-directed learning* were supported by the majority of the participants. In addition, the new factor of both *extrinsic* and *intrinsic motivations* was identified by a significant number of the participants as a factor that drives adoption.

Managerial Tenure

In the management innovation literature managerial tenure is found to be a micro level factor that impacts on the adoption of management innovations, and as such, it represents the rational perspective of MI. Yet, in our study, the impact of managerial tenure on the adoption of open innovation practices as MI was not found to be significant by the majority of the participants (P1-P7, P10, P12, P15, P16, and P22). There was a common agreement among this group of participants on the idea that their managerial tenure does not matter, because the adoption behaviour depends on the individual and their personality rather than the time they have spent in an organisation. For example, P2stated:

> *"Well, not too much, because for example, we've just got a new CEO that has just joined. He joined in April, he's already made changes within the company. You know,*

so he's brand new and he's already made lots of changes. People are adopting them. So, I'd say it does not necessarily matter, because people come in and change things overnight no matter how long they've been at the company."

Similarly, P22:

"Not for me personally. I think I get on board fairly quickly. I do think that, obviously perhaps knowledge when you get a new person in, a new senior manager in, they might not jump on adopting innovation straight away. They need to understand the business first."

This reoccurring pattern among participants suggests that at the individual level of adoption and from the individual perspective for successful adoption and diffusion the individual has to demonstrate a certain set of skills such as being open minded, having a learning nature and the ability to adapt to a new environment. This does not, however, diminish the role of managerial tenure in the form of knowledge and previous experience, but this pattern was observable mostly among those individuals who are engaged in the open innovation practices that require building human relationships (P8, P9, P11, P13, P14, and P16-P21). On this note, P13:

"Yes. I think, you know, I think I've mentioned a few of them, for example, supply integration. I think that knowledge and experience of using them before. In terms of contracting, well, maybe less, so much, but of course, I think throughout all my experience, you know, where I've worked at, we've always used contractors and brought them in for certain tasks. So, so yes, you know, it is a, is a factor there."

This statement provides evidence that managerial tenure may be a factor in those cases where one needs to have long and established connections and trust built with external collaborators. In this scenario, managerial tenure may be seen as an advantage rather than a factor that impedes the adoption process.

Cosmopolitanism/ International Experience

In this study cosmopolitanism or international experience represents the rational perspective of management innovation and is defined as *"individuals with broad experience in many countries"* (Haas 2006, p.367). The impact of international experience on the adoption of open innovation practices was supported by the majority of the participants (P2-P9, P12, P14-P16, and P19-P22) in this study. There was a strong consensus among the participants on the point that international experience provides them with important market knowledge and cultural nuances, which is important when trying to build external collaborations or approaching new markets with ideas. In particular this topic was discussed by (P2, P4, P7-P9, P12, P14, P15, P19, and P20). On this note, P22 suggested:

> *"It opens your perspective, makes you more open and it is important when you open up your business model. You become more flexible because you learn about different cultures. You have to adapt as a person at some point in a different culture and that makes you more adaptable. So innovation scares you less versus, somebody who lived their entire life in one house and never experienced a different culture. Any change might be a bit scary. And that's just a psychological thing."*

Thus, this reveals that those individuals with international experience have the advantage of being more welcoming towards foreign culture and have less challenges adapting to this new culture, which in turn can reduce the NIH (Not-invented-here) and NSH (Not-sold-here) syndromes. As was demonstrated in the literature review chapter of this study, these two syndromes are seen as major obstacles to adoption. The role of international experience is particularly observable among those participants who represent the expatriate community in Hong Kong. For example, P9- an American expatriate whose business is split between the USA and the APAC (predominantly Hong Kong):

> *"...and this is the same when it comes to buyer behaviour. So in Japan, they don't like a lot of those graphics on the platform. So if you adopt an open source, they don't like what we have in China. So it needs to be more, more sort of abstract and less colour. On the other hand, you go to, we go to China, their websites and the platforms are extremely busy with a lot of information. Now in the US and to some point in Hong Kong, I mean, they like more streamlined, more fashionable, platforms and sites. So yeah, so it, it really varies, people that use the platform, people that have worked on the platforms, people that have"*

The statement above can also be supported by the fact that the positive impact of international experience was indicated as a facilitating factor two times more by participants who are expatriates in the APAC (Hong Kong, Singapore, Japan in our data sample) than those who represent their place of origin. Thus, in the first instance it was 12 participants (P2-P4, P6, P7, P9, P10, P12, P14, P15, P19, and P20), while in the second 10 participants (P1, P5, P8, P11, P13, P16, P17, P18, P21, and P22). With regard to the latter group, the majority of participants were born in their places of origin and either never left their countries (e.g., P18) or relocated back after studying abroad (e.g., P17) . This can be explained by the fact that for decades Hong Kong as part of the APAC has been considered as one of the most popular expat destinations and has a large number of expatriates residing in the city. According to the HSBC Expat Explorer (2018) 84% of the expats in HK are employed, with the majority coming from Europe (43%) to progress in their career (40%). Evidently, it has a higher concentration of people with professional experiences and with diverse cultural backgrounds than the United Kingdom. Although the recent political events suggest the HK's expat community might be shrinking (Einhorn, 2020), the participants in our data sample had resided in the city for a long while.

Self-directed learning

According to Knowles (1975, p.167), self-directed learning is defined as: *"a process in which learners take the initiative, with or without the help of others, in identifying their learning needs, formulating learning goals, choosing learning resources, employing suitable learning strategies, and assessing learning outcomes".* In our study the impact of this factor on the adoption was found to be significant by the overwhelming majority of the participants (P1-P4, P6, P8, P10, P11, and P13-P22). There was a common agreement among the participants that the reason why self-directed learning impacts on the adoption process is because it helps to address challenges and increase personal motivation. This topic was discussed by P8, P11, P13, P16, and P18. On this note, P13 stated:

> *"I would say it does play a factor into that for sure. I would certainly say it does motivate myself personally. Just based on, sort of the success and the results I've seen from, you know, going off and investigating it myself it motivates me to investigate further and then look to, you know, actually bringing or introducing these new practices, basically*".

This suggests that those individuals who feel motivated and competitive by looking at others are the ones that are more likely to drive an adoption through organising their learning routine. This in turn can facilitate their decision making when it comes to adoption. This claim was brought up by P2-P4, P6, P10, P14, P20 and P21. For instance, P4 explained how self-directed learning affects their decision in comparison to others:

> *"Yes, definitely. For me. The other, the other people [sic] decisions though aren't necessarily the same as me. I think, I think the guy in China and the two from America, go more with their heart. I would say that affects my decision more."*

Thus, this reveals that at the individual-level SDL plays a crucial role in promoting independent and strong thinking that can later alter the course of adoption. However, not all individuals are self-motivated and organised for SDL and thus organisations need to promote a learning atmosphere or create the conditions for it. This point was discussed by P15, P17 and P22. On this note, P17 stated:

> *"We often do that. I think I am actually very supportive, and we always support our team and other people who want to learn more and then they want to bring something new, new approach or new kind of a tool, to actually enhance our work and actually do it in a better way. Sometimes we had several cases, when we actually found out that our partner university [sic] using this and that from their website or other information, other colleagues, and then we actually ask our partners to provide information on that additional work, do some meeting or call so we can discuss this and start implementing (their practices) in our university."*

This statement highlights the important point that those individuals who feel encouraged by their managers and organisations to learn can drive the adoption of new practices by themselves. In other words, the adoption process can happen from a bottom-up approach rather than top-down. This also demonstrates the importance of having an open culture, where employees feel confident and motivated to put their ideas forward.

Extrinsic and Intrinsic Motivation

During the general discussion on what factors impact on the participants' decisions to adopt open innovation practices from an individual perspective, the vast majority of them indicated that their adoption behaviour is driven by a personal motivation, vision and belief in making things better, either to achieve organisational goals, or personal goals. According to the

literature on social psychology, this type of behaviour can be attributed either to extrinsic or intrinsic motivations, and they both form Self-Determination Theory (SDT) as per Deci and Ryan (1985) and many other subsequent versions of their work, e.g., Deci and Ryan (2012; 2017). While extrinsic motivation describes a behaviour in which an individual is engaged to get a separable outcome, intrinsic motivation describes a behaviour in which an individual is involved to attain natural joy and satisfaction (Ryan and Deci, 2000). Thus, in regard to the adoption of open innovation practices, the factor of extrinsic motivation was discussed by the following participants (P1, P2, P7-P9, P11, P13-P17, P19, and P22). For example, P16 stated:

> *"I personally believe that open communication is the key to success and better efficiencies. So, for me, it aligns to the goals that I need to achieve for my job satisfaction. So, for me, it's just a step or a process that gets taken in the way, because I need to do it to achieve the goals I have to achieve."*

The common agreement among this group of participants provides evidence that at the individual-level of analysis, those individuals who have clearly defined goals set by their organisation are more likely to push the adoption of OI practices, because they have extrinsic rewards. From this perspective, having extrinsically motivated individuals can be seen as an advantage. However, if managers fail to identify the correct goals for each of their subordinates, then the adoption process may fail. This does not mean, however, that the adoption of OI practices is driven only by extrinsically-motivated individuals. On the contrary, in our data analysis we were able to identify those who demonstrated intrinsic motivation. This factor was discussed by P10, P12, P20, and P21. On this note, P10 (PropTech/crowdsourcing) stated:

> *"The vision, but I think it's just trying to create some change, you know, in the industry. I was just really frustrated with the way the industry works. A lot of industries, you know, so many inefficiencies and just wastage. For me, it's like just stupid ways of working. You know, why keep repeating work and doing basic work and stuff like that. So it's mainly just to bring about change and then I think it needs like some different ways of thinking and different ways of doing things you know, to move the industry forward."*

This evidence demonstrates that at the individual-level intrinsically motivated adoption of OI practices can happen in those scenarios where an individual feels a general disappointment

and wants to bring about change. This type of adoption also requires a certain pattern of thinking, i.e., a creative mind. For example, P21 claimed:

> *"But on a personal level what motivates me is that well I love, I love being creative and I think open innovation needs a creative mind."*

Altogether this suggests that the identification of intrinsically motivated individuals within or outside of organisations can be quite challenging as not everyone may demonstrate natural joy. Even in our data analysis, the number of people that are extrinsically motivated is higher than those who have pure intrinsic motives, which emphasises the importance of correctly aligning employees' personal goals so that they will be motivated to achieve them.

5.5 POST ADOPTION IMPACT ON INDIVIDUALS

The third and the final stage of the findings is focused on presenting how the adoption of the discussed open innovation practices as management innovation impacts on individuals across the following three dimensions: *work engagement, work satisfaction and personal productivity*.

Table 5.3 provides a summary of the findings obtained from the participants based on the propositions suggested in Chapter 3 of this study. As can be seen from Table 5.3, the vast majority of the participants agreed that the adoption of open innovation practices has positively impacted their work engagement, work satisfaction and personal productivity. Only two participants, P7 and P19, demonstrated different results in comparison to the others. While P7 did not agree that the concept of open innovation can be considered as one of the ways to manage people and improve their work, P19 stated that it is still too early for them to make any conclusions. The subsections below will provide a more detailed analysis of each of the factors listed in Table 5.3.

Table 5. 3. Post-adoption impact of open innovation practices as management innovation on the participants

Factor	Result	Supported by (N=22)
Work engagement	Supported	P1-P6, P8-P22
Work satisfaction	Supported	P1-P6, P8-P18, P20-P22
Personal Productivity	Supported	P1-P6, P8-P18, P20-P22

5.5.1 GENERAL ASSESSMENT OF THE ADOPTION OF OPEN INNOVATION PRACTICES ON AN INDIVIDUAL'S WORK ROUTINES

Prior to examining how the adoption of open innovation practices impacted on the participants across the three dimensions outlined in Table 5.3, the participants were asked to discuss how the adoption of these practices had addressed their managerial daily routines and the challenges associated with it in comparison to before. Although no common factor has been revealed, the majority of answers can be split into two themes. Firstly, there are ***changes in job responsibilities*** (P1-P3, P5-P7, P9-P14, P16, and P20) and secondly, an ***opportunity for a personal growth*** (P17, P18, P21, and P22). In regard to the first theme, there is common agreement between the participants that changes in job responsibilities come from the way employees operate and how the participants manage their subordinates, as well as how time management changes and, thus, priorities shift. For example, P1 spoke about how the adoption of certain open innovation practices changed responsibilities in their team:

> *"So, a lot of changes, first one with the outsourcing that frees up time, and that gives you time to work on more strategic stuff. Because as I said, for manual and executional stuff has been outsourced and that also creates more opportunities for the development for the team within the organization, because now they're doing more senior level stuff. It also changes how the team operates as now they're operating at a senior level and not at the junior level. So that changes demand management structure a little bit*."

This revelation highlights two points. Firstly, and as already discussed earlier in this chapter, in comparison to before the main advantage that comes with the adoption of open innovation is more time, i.e., with more time the routines (techniques) to complete a certain task change. Secondly, and as a result of more time, employees are able to refocus their priorities, which essentially transforms their roles from junior to more senior levels. These two points are in line with changes in *organisational structures* and *techniques,* which distinguish management innovations from other types of innovation, as was discussed in chapter 2 of this thesis.

As for the second theme, ***an opportunity for a personal growth,*** it became clear that the adoption of open innovation practices facilitated the development of new skillsets for the participants and allowed for their personal growth. For example, P18 talked about the skillsets that they had to develop as a part of their open innovation:

> *"So, whereas when I started I only had three of them (skillsets) and the fourth one had to be built from scratch. Unless you have somebody that is not, unless you're somebody that is open to learning, it becomes very hard for you to remain in this practice. Because of so many dynamics that you are required to be aware of- outside technology alone, outside the business, outside the regulations, the legal, the marketing, so many buckets where you need to have some knowledge." (P18)*

This once again suggests that at the individual-level the adoption of open innovation practices facilitates changes in organisational structures, because individuals who are asked to participate in the adoption need to acquire new skills in order to be able to execute the adoption process and push it forward throughout their organisation. The acquisition of new skillsets also corresponds to changes in their responsibilities. This does not mean, however, that such changes are always seen as positive. On the contrary, in some cases the adoption of these practices can be quite challenging, because from the individual-perspective the responsible agents have to learn how to manage new partnerships that potentially come from different cultures etc. In other words, not only do individuals learn how to acquire new skills, but also they need to have an open mind about foreign elements that come with the adoption. These challenges were discussed by P2, P5, P7, P10, and P12. For instance, P5 spoke about the challenges that come with outsourcing:

> *"Once you outsource, you have to deal with different firms, different regulations, different companies, there's language barrier [sic] as well. Which you wouldn't necessarily have within your location. To an extent, more complicated, because I do have to work with different time zones basically."*

5.5.2 WORK ENGAGEMENT

According to Schaufeli et al. (2002), work engagement describes *"…as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption."* (p.74). In order to assess the post-adoption impact of open innovation practices, participants were interchangeably asked two questions: whether they find their work more meaningful or feel more immersed in their work since engaging in open innovation practices. The positive impact of the open innovation practices was supported by the overwhelming majority of participants in our study. In particular, three topics were identified during the data analysis stage.

Firstly, participants stated that they feel more engaged, because as a result of the adoption of OI practices they are able to create value, i.e., *work engagement through value creation*. This topic was discussed by P9, P10, P12, P14, P16, P17, and P20-P22. For instance, P10 in their discussion on the adoption of crowdsourcing solutions stated:

> *"Yeah, definitely. I think, because you see that you now are creating value for people, see the people who are adopting it, seen value in using it. So, you know, I think it definitely makes my work meaningful, especially when you see people logging in, using it by sending you data, accessing data they need and stuff like that. So, I think that then that gives us like a good feeling. It shows like they need what we're doing and then kind of find it useful."*

This statement by P10 and the fact that this topic was discussed by other participants in this group demonstrates that the adoption of OI practices allows participants to create value, which in turn makes them feel more engaged in their work. The reason behind that might be explained by the fact that with the adoption of these OI practices individuals are not only able to create something new, but also to commercialise this new idea or product, which aligns with their organisational goals as they are able to provide better services. Additionally and at the individual-level, as a result of adoption it makes individuals feel more appreciated, which in turn increases their personal motivation and further engagement.

Secondly, there was a common consensus among the participants, who agreed that their engagement increases, because they learn new things, i.e., *work engagement through learning.* This topic was discussed by P2, P5, P6, P8, P15, and P18. On this note, P6 stated:

> "*Absolutely. Short answer is absolutely. The reason why that is, is because I take great meaning and value in my work. When I am learning new things, I am reinventing myself, I'm in disrupting. And when I am disrupting myself and it means I'm innovating myself and these practices. There they are not without risks. I'm sure you can agree with that right there.*"

This statement by P6 offers two important insights. Firstly, individuals are able to acknowledge that there are risks and challenges that come as a result of the adoption of OI practices. In fact, this was demonstrated earlier when participants referred to adjusting to new time zones and new languages (e.g., outsourcing). Secondly, these challenges push certain individuals to learn new things, which in turn keeps them engaged in their work.

Thirdly, participants agreed that the reason they feel more engaged is because they are now part of a community, i.e., *work engagement through being part of a community*. This topic was discussed by P3, P11, and P19. For instance, P11 stated:

> *"Yes. I think it's just nice. It's probably worth working in an environment where you've got like-minded people and I guess it's when you put more people to support on the single problem, it's just, it's better than just having all of that on your own shoulders."*

Based on this it can be said that in comparison to before in certain organisations individuals did not feel engaged, because there were not enough resources and knowledge in their organisations. However, as a result of the adoption of OI practices they are now exposed to more professionals, which in turn increases their work engagement. This might also suggest that some individuals may find themselves be outside of their organisational boundaries since they find themselves more useful within these external collaborations. This issue was briefly discussed by Bogers et al. (2017).

5.5.3 WORK SATISFACTION

According to Locke (1976), work satisfaction is *"the pleasurable emotional state resulting from the perception of one's job fulfilling or allowing the fulfilment of one's important job values"* (p.1342). Participants were asked whether they feel more content with their job as a result of the adoption of open innovation practices. The vast majority of the participants agreed that they can see their satisfaction increasing as a result of adoption. In particular, the following two topics were most common among certain participants.

Firstly, as a result of adoption they are able to target personal goals, i.e., *work satisfaction through achieving goals*. This was a common topic of discussion by P9, P12, P13, P16, P17, and P21. For instance, P12, who drives the adoption of the open innovation practices in their organisation and is responsible for training staff on it, said:

> "*Yeah, absolutely. I can say it's kind of, it's kind of one of my KPIs to be honest. So, when it comes to my annual review this is, you know, it's part of my job spec. So of course, if all goes, well, then the happier, the more content I'm going to be as a human*."

This point by P12 indicates that for the majority of participants in our study from the individual-perspective the work satisfaction is closely aligned with how well they perform at

their work places. From this perspective, the application of OI practices is seen as a tool that helps them to achieve personal goals and change their daily routines. Thus, the application of OI practices changes how management work is done- one of the features that differentiates management innovation from other types of non-technological innovations as discussed in section 2.4.2 of chapter 2.

Secondly, as a result of OI adoption participants have more diverse options, i.e., *work satisfaction through more opportunities*. This point was highlighted by P3, P4, P8, P11, and P14. For example, P3 discussed outsourcing:

> "*It gives me more freedom, to be able to work wherever I want. I'm much more flexible. It gives me more freedom to attack new markets. I mean, in Asia, where I am trying to sell my technology. I do not think I would be able to do that if I was working in the same way that it was working, when we started to work, where we tried to do everything in house. Now we adopt a lot of people around the world, we are much more confident to be present in Asia and offer our services".*

This discussion by P3 demonstrates not only why individuals feel more satisfied in their jobs, but also once again highlights the relative advantage that comes with the adoption of OI practices, something that was not possible in previous models. Through access to distributed knowledge and resources, individuals are now able to deliver more products to market and have options to choose from, which in turn contributes to their satisfaction.

5.5.4 PERSONAL PRODUCTIVITY

According to Pritchard (1995) productivity is not only limited to efficiency and effectiveness, but it also describes things like absenteeism, turnover, innovation, morale and others. In order to evaluate participants' personal productivity, they were asked whether they generate more innovative ideas or feel less absent from their jobs because of the adoption of open innovation practices. In general, the majority of participants agreed that their productivity has increased as a result of OI adoption. In particular, two topics were identified.

Firstly, participants suggested that their productivity increased because of changes happening in their job routines, i.e., *productivity through consistency*. This was highlighted by P2, P3, P6, P9, P13, P14, P16, and P21. For example, P2 stated about beta-testing:

> *"I mean, when you remove repetitive or menial tasks, by using some form of operational workflow improvements such as by automation (beta-testing). You know,*

that also makes me and my team less absent and more productive, because you know, doing repetitive tasks is quite boring and people find it hard to kind of do that over a long period of time. So, by making things more efficient, you make employees be more innovative".

This statement offers important insights, because it demonstrates how at the individual-level the adoption of OI practices improves employees' job routines by aiding them to achieve better results in a short amount of time. Additionally, this increases their general well-being, which in turn contributes to personal productivity as they are able to focus on different tasks and become more valuable assets for their teams and organisations.

Secondly, participants stated their productivity increases because they are part of a discussion, i.e., *productivity increases through reciprocal conversation.* This reason was discussed by P4, P5, P10-P12, P17, and P22. For instance, P17 explained:

"…even during this COVID we saw a lot of changes from our partners. They were able to give us some feedback. And because of that, also, we were thinking how we can do better. And in this online mode how we can enhance our services and we are being able to adopt a lot of new approaches. So, I think mostly, we were changing the way of working, so more innovative, always searching something new, always trying new things and making sure that we are not behind and we're coping with our current issues."

This revelation suggests two things. Firstly, because the participants are now exposed to a community of like-minded people, who are external partners, there is a constant conversation and exchange of novel ideas. Secondly, through working with external partners and as a result of OI adoption, participants are able to acquire feedback that is later applied within their organisations for further improvement.

5.6 TEXT MINING DATA ANALYSIS

In order to provide a better understanding of the qualitative interpretation of the interviews' data, this study also utilised a text mining approach through a software program called Wordstat. The software was applied to the interviews' transcripts to identify new patterns and relationships based on the participants' interviews. Thus, the results of this exercise will be focused around three areas. The first area is related to term frequency. The second area is

related to phrases frequency. Finally, the topic clusters analysis that shows the findings in a more organised way through identifying links between topics and keywords that have a high correlation between each other.

5.6.1 TERM FREQUENCY

Table 5.4 contains a list of the most frequent terms derived from the interviews through an application of Wordstat. The columns in Table 5.4 stand for the following: No.Cases and % Cases indicate the number of interviews (N=22) a particular term has occurred in. TF IDF is an abbreviation for the Term Frequency-Inverse Document Frequency, which shows how significant a certain word is to a document in a collection of documents (Rajaraman and Ullman, 2011). Table 5.4 contains the top 50 most frequent terms. For the full list of 300 terms, please refer to Appendix E.

As can be seen from Table 5.4, such terms as *people, team, client, partner, and customer* can be linked to the importance of the human aspect of both management and open innovation concepts from the individuals' perspective. Surprisingly, the terms open or management do not appear as the most frequent ones. This can be explained by the fact that during the interviews when talking about the application of management or open innovation concepts within their companies, participants mostly referred to words like i*nnovation, product, technology, data, tool, idea, service, solution* and others. For example, P1, when asked about management innovations in their organisation:

> *"I participate on those innovations as either a beta participant, or either as a QA team, or as a tester. I do not drive those innovations. But yeah, there are a lot of management innovations that drive changes in our whole structure and strategy, the systems, how we work, and those innovations happen."*

On the other side, participants were mostly focused on discussing certain types of open innovation practices rather than the concept as a whole. For example, the frequency of such terms as *outsourcing, university* (partnerships) and *beta-testing* demonstrate how the participants perceive the concept of open innovation.

Table 5.4. Term frequency based on text-mining

Term	FREQUENCY	NO. CASES	% CASES	TF IDF
PEOPLE	366	21	95.45%	7.4
BUSINESS	214	17	77.27%	24
START	173	18	81.82%	15.1
INNOVATION	164	20	90.91%	6.8
PRODUCT	150	20	90.91%	6.2
TECHNOLOGY	149	17	77.27%	16.7
DATA	138	14	63.64%	27.1
TEAM	127	20	90.91%	5.3
ADOPT	124	19	86.36%	7.9
OPENINNOVATION	124	20	90.91%	5.1
CLIENT	121	12	54.55%	31.9
PARTNER	121	14	63.64%	23.8
CUSTOMER	119	10	45.45%	40.7
YEAR	119	18	81.82%	10.4
IMPACT	111	19	86.36%	7.1
OPEN	106	18	81.82%	9.2
TOOL	106	14	63.64%	20.8
IDEA	103	20	90.91%	4.3
PROCESS	100	20	90.91%	4.1
MARKET	95	16	72.73%	13.1
ORGANIZATION	94	18	81.82%	8.2
BRING	86	12	54.55%	22.6
MODEL	80	18	81.82%	7
CREATE	74	18	81.82%	6.4
DECISION	74	17	77.27%	8.3
FACTOR	74	19	86.36%	4.7
SERVICE	74	17	77.27%	8.3
EXTERNAL	73	16	72.73%	10.1
OUTSOURCE	73	12	54.55%	19.2
AGENCY	71	9	40.91%	27.6
SOLUTION	71	11	50.00%	21.4
MAKE	69	18	81.82%	6
PLATFORM	68	11	50.00%	20.5
TALK	68	18	81.82%	5.9
PROBLEM	65	14	63.64%	12.8
ADOPTION	63	16	72.73%	8.7
FEEL	63	18	81.82%	5.5
PROJECT	61	14	63.64%	12
BUILD	60	16	72.73%	8.3
SUPPORT	60	18	81.82%	5.2
UNIVERSITY	60	4	18.18%	44.4
BETATESTING	59	10	45.45%	20.2

DAY	59	14	63.64%	11.6
LEVEL	59	18	81.82%	5.1
LEARNING	57	18	81.82%	5
MONEY	57	13	59.09%	13
INNOVATIVE	56	11	50.00%	16.9
PROVIDE	56	17	77.27%	6.3
SUPPLIER	56	8	36.36%	24.6
RISK	55	10	45.45%	18.8
CALL	54	16	72.73%	7.5

In addition to Table 5.4, Figure 5.2 presents a word cloud based on the most frequent terms in the full version. In other words, Figure 5.2 is a visual illustration of the most frequent terms and their position in relation to each other.

Figure 5.2. Word cloud based on text-mining

5.6.2 PHRASE FREQUENCY

Table 5.5 contains a list of the most used phrases extracted from the interviews' transcripts as a result of text-mining analysis. The columns in Table 5.5 stand for the following: No.Cases and % Cases indicate the number of interviews (N=22) a particular phrase has occurred in, length indicates the number of words in the phrase, and TF IDF is an abbreviation for the Term Frequency-Inverse Document Frequency. Due to the number of phrases (total 240) picked up by the software, Table 5.5 contains only the first top-40 phrases used. For the full list, please see Appendix F.

Unsurprisingly the most used phrase is *management innovation*, followed by *business model* and *open innovation practice.* This can be explained by the fact that in the participants' understanding the connection between management and open innovation lies in the correct alignment of the organisational business model. Thus, when talking about each of the innovation practices participants link it to how their business model operates. For example, P6, when asked about the application of open innovations in their company:

> *"And what I mean by that is the purpose of start-ups is because they have a maintenance thing type of technology or business model that has a technology that is 10x better than the status quo. So, as a start-up, you constantly have to think about innovative practices to be able to stay alive for lack of a better word."*

Additionally, it can be seen that the phrases shown by the software demonstrate the TOEI contexts in the matter of frequency. For example, *top management, top management support, big company, small company* refer to the organisational context. Similarly, phrases like *external factors, climate change, fashion setters,* and *government regulation* represent the environmental context, whereas *(self) direct learning* and *international experience* illustrate the individual context of the TOEI framework. The frequency of the phrases used can also indicate the importance of factors from the participants' point of view when it comes to the adoption of open innovation practices. Thus, top management support as an organisational factor is the most important from the participants' perspective, whereas climate change as an accumulative external factor highlights the fast-changing market landscape that forces companies to consider external factors that go beyond our traditional understanding of environmental contexts when it comes to the opening up of their business models.

In regard to the open innovation practices the most cited ones are *supplier integration, external technology (commercialisation), institutional collaborations, user community, beta-testing,* and *(third) party intermediary*. This representation very well reflects the industries that the participants represented during the interviews as well as the activities these industries are involved in, i.e., marketing and advertising, the technology and education sectors.

Table 5.5. Phrase frequency based on text-mining

Phrase	FREQUENCY	NO. CASES	% CASES	LENGTH	TF IDF
MANAGEMENT INNOVATION	21	11	50.00%	2	6.3
BUSINESS MODEL	20	10	45.45%	2	6.8
OPENINNOVATION PRACTICE	19	12	54.55%	2	5
TOP MANAGEMENT	19	10	45.45%	2	6.5
BIG COMPANY	17	8	36.36%	2	7.5
EXTERNAL FACTOR	17	10	45.45%	2	5.8
CLIMATE CHANGE	15	1	4.55%	2	20.1
FASHION SETTER	14	13	59.09%	2	3.2
YEAR AGO	13	8	36.36%	2	5.7
CUSTOMER PROBLEM	12	1	4.55%	2	16.1
DIRECT LEARNING	12	8	36.36%	2	5.3
INTERNATIONAL EXPERIENCE	12	11	50.00%	2	3.6
SUPPLY INTEGRATION	12	4	18.18%	2	8.9
EXTERNAL TECHNOLOGY	11	3	13.64%	2	9.5
INSTITUTIONAL COLLABORATION	11	4	18.18%	2	8.1
ADOPT OPENINNOVATION	10	3	13.64%	2	8.7
DECISION MAKE	10	4	18.18%	2	7.4
GOVERNMENT REGULATION	10	8	36.36%	2	4.4
SMALL COMPANY	10	5	22.73%	2	6.4
START UP SOLUTION	10	1	4.55%	3	13.4
USER COMMUNITY	10	4	18.18%	2	7.4
BETA TESTING	9	6	27.27%	2	5.1
END HAVE THE DAY	9	4	18.18%	4	6.7
POINT HAVE VIEW	9	4	18.18%	3	6.7
PRODUCT FORWARD	9	1	4.55%	2	12.1
REAL ESTATE	9	3	13.64%	2	7.8
PARTY INTERMEDIARY	8	6	27.27%	2	4.5
STAFF MEMBER	8	3	13.64%	2	6.9
TOP MANAGEMENT SUPPORT	8	7	31.82%	3	4
WORK FROM HOME	8	3	13.64%	3	6.9
EARLY STAGE	7	4	18.18%	2	5.2
IMPACT THE ADOPTION	7	5	22.73%	3	4.5
INNOVATIVE SOLUTION	7	4	18.18%	2	5.2
INSURANCE COMPANY	7	3	13.64%	2	6.1
LONG TIME	7	5	22.73%	2	4.5
PERSONAL LEVEL	7	5	22.73%	2	4.5
PHYSICAL RISK	7	1	4.55%	2	9.4
PLAY A PART	7	1	4.55%	3	9.4

STAKEHOLDER MANAGEMENT	7	1	4.55%	2	9.4
START UP PARTNER	7	1	4.55%	3	9.4

5.6.3 CLUSTER ANALYSIS

Central to text-mining analysis is the cluster analysis. The text-mining software performs cluster analysis in such a way that it groups keywords under a certain topic with which these keywords show close correlation. A researcher then can group the topics under bigger themes as will be later demonstrated in Table 5.6, which can be found at the end of this section. Because the cluster analysis performed for this study is based upon transcripts, it might resemble the semi-structured interview framework. As a matter of fact, the grouping of themes for the cluster analysis was performed in order to confirm the existing findings and/or to identify any new, additional insights. So, in the case of this study the themes identified for the cluster analysis should be regarded as the contexts of the TOEI-MI framework as per chapter 3 of this thesis.

Table 5.6 demonstrates the thematic grouping of topics. The columns *theme* and *TOEI factors* have been added by the researcher, while the remaining columns are generated by the software. As can be seen from Table 5.6, the topics generated by the software were grouped into seven themes, and this theming reflects the TOEI contexts as well as general questions on MI and OI. These themes are: 1) *technological* with topics like SOLVE CUSTOMER, PUSH OUR PRODUCTS FORWARD, PRACTICES COMPATIBLE, ALIGN GROW, CONVERSATION EFFICIENCY, QUICKLY FAST, RUN TRIAL; 2) *organisational:* DEPARTMENT COLLABORATION, SIZE OFFICE, PROCESS INTERNAL; 3) *environmental*: CLIMATE CHANGE, REAL ESTATE, BANKING SERVICE, EXTERNAL FACTOR, GOVERNMENT REGULATION, CLIMATE CHANGE; 4) *individual*: GLOBAL VIEW, SYSTEM LEARNING, ROLE LEARN, PERSONAL LEVEL; 5) *post adoption*: APPROACH STAFF, IMPROVE PERSONALLY; 6) *OI practices*: SUPPLY INTEGRATION; CONTRACTOR; BETATESTING FEEDBACK; VENTURE BETA; FIELD EXPERTISE; AGENCY CREATIVE; PLATFORM INTEGRATE; LICENSING REPORT; 7) *OI and MI*: PROGRAM DEVELOP SOLVE.

Each of the clusters identified will be discussed in greater detail below.

Technological Cluster

Based on the number of topics generated for each of the themes, *technological cluster* is the one with the most topics generated. This potentially implies a greater importance of technological characteristics of OI practices on their adoption to the individuals in our study. Although in Table 5.6 the grouping of themes and factors resembles the outline of the interviews and what was previously discussed in this chapter under the qualitative results, there are a few differences from the discussions earlier that are worth mentioning. Firstly, based on the text mining results, greater emphasis has been given to the relative advantage of the OI practices. For example, the relative advantage of the open innovation practices can be traced in such topics as SOLVE CUSTOMER, QUICKLY FAST, RUN TRIAL through such keywords as *solve, scale, solution, quickly, fast, result* and others. In other words, in comparison to the old existing models, the participants adopt open innovation because it helps them to solve current challenges and deliver their products faster to the market, which eventually scales up their businesses. For instance, P9 stated:

> *"So I think when you use these types of open practices, you know, I think the time to market is good and it's also, it's already proven so that you don't have to go through the, see if it works or not. So, in terms of improvement, I would not say it's the quality of program, but it's the time to market improvement is the, it's a familiarity improvement, it's just the scalability improvement, what you had before in comparison."*

This highlights the improvement in time in comparison to before, but not the time that it takes to complete tasks at work, as was discussed in the qualitative findings, rather the time that it takes to create value and deliver products. Secondly, something that had not come up distinctively in the qualitative discussion is the financial aspects of the adoption of OI practices. Keywords such as *revenue, price, revenue, money, financial*, appear under the topics CONVERSATION EFFICIENCY, RUN TRIAL. This implies financial motivation when it comes to adoption. Although this motivation could be the primary one, the participants in our study chose not to focus on this aspect as it was shown in the qualitative findings.

The two points discussed under this cluster confirm the actual benefits of the OI paradigm as discussed in chapter 2 of this study as well as demonstrating that individuals are very well aware of the benefits of OI practices, which drives its adoption, i.e., relative advantage. In

other words, when adopting these practices individuals are focused on their business benefits and do not always think about managerial consequences and how these practices can be used from the management perspective. However, as the qualitative data analysis of the technological context demonstrated, the adoption of these practices is a form of management innovation since it impacts on employees and contributes to changes in organisational structures. In particular, our qualitative findings suggested that with the adoption of OI practices individuals now have more time, which they can allocate to other tasks.

To sum up, when we compare the findings from the qualitative analysis with the findings obtained from text-mining, the following can be said. In the qualitative findings the emphasis was put on what the adoption of the OI practices means to the participants from the individual-perspective. Based on the text-mining results it can be seen that the emphasis is rather on what the adoption means to the organisations.

Organisational Cluster

In regard to the organisational cluster, only three topics were derived by the text-mining software as can be seen from Table 5.6. Unlike the technological cluster, the grouping of topics under this cluster does not strictly follow the organisational context of the TOEI-MI research model. While in the research model we had such factors as *size, organisational culture* and *top management support*, in this grouping only size remains the same. From the one side, it highlights the role of size in the adoption of OI practices. From the other side, it opens the possibility of exploring other factors. Thus, based on the topics identified and the keywords attributed to the topics, it can be implied that *office layout* may facilitate the adoption of OI practices, i.e., office layout is a new organisational factor that has not been identified before. For instance, under the topic DEPARTMENT COLLABORATION there are such keywords as *department, digital, space, collaboration, online*. This could suggest that for a further diffusion of OI practices and ideas within organisations a better collaboration between employees can be achieved through designing better spaces and encouraging better conversation between employees. Especially, this will be a factor for large and multinational corporations. On this note, P14 stated:

> *"Internally also it takes time, for accepting these open practices, right? So, our company is laid out in multiple countries and based on the cultural differences. Sometimes it is harder, more difficult to implement it. I mean, there are local offices, where we try to adopt these practices and, because of the nuances in that region, I*

mean, the stage in which they are in they may not adopt, adopt, or they might not be interested in adopting."

This statement offers important evidence to support the claim made above. Firstly, P14 comes from a large and multinational corporation. Naturally, the adoption of open practices in different cultures will take a while or may fail as their statement implies. Secondly, P14 emphasises the role of local offices, where culture will be different from the whole organisational culture. This pattern can also be traced under the topic SIZE OFFICE, with such keywords as *office, country, adoption, and employee*. By focusing on promoting unified office culture through collaborative layout, organisations may improve the internal diffusion of open practices. In particular, this issue will be present for post-Covid-19 workspaces. With more employees working from home and being exposed to their home culture, TMS will need to ensure that openness is being promoted equally among all levels. This can be done either through improving work spaces or introducing digital collaborations between those agents who drive these open innovation practices and those who have to practise them on a daily basis. From this perspective, the application of open innovation practices will naturally transform managerial practices as well, because in order to adopt the OI practices, organisations will need to accommodate for their working space better. In fact, some of the participants in our study implied how the office layout promotes more open collaboration in comparison to before. For instance, P11, when discussing general factors, said the following:

"….internal environment was hierarchical, where you've got, say the senior directors have their corner office and they don't come out and talk to the team, and everything was very say in a suit jacket. Then probably now we moved more towards a model where essentially we want a hundred percent working from home as a company to adapt the ways of working to be a lot more open."

This statement provided by P11 supports the discussion above. Similarly to P14, P11 comes from a large company, but with only one office location in the United Kingdom. P11 clearly states how before the adoption of certain practices, supplier integration in this case, their office had a closed layout. However, under the impact of OI practices and the work from home culture top management needs to come up with a strategy where everyone is able to enjoy the same open structure.

To sum up, when comparing the results from the qualitative findings and text-mining findings the following can be said. Both in the qualitative and text-mining findings the emphasis is put

on the size of the organisation as one of the factors that impacts on adoption. While the qualitative findings confirmed the impact of organisational culture and TMS, the text-mining results explored a new factor, which can be classified as *office layout*. From the one side this factor can be categorised within an organisational culture, from the other side it provides a tangible aspect of an organisational culture that could potentially impact on the adoption process. Finally, the role of TMS can be seen as a part of organisational culture rather than a factor on its own. This was confirmed earlier in the qualitative findings.

Environmental Cluster

The topics derived from the text-mining software for under the environmental cluster are listed in table 5.6. Similarly to the technological cluster and unlike the organisational one, the environmental cluster demonstrates a high number of topics generated. This shows the importance of external factors for the adoption of OI practices, especially in the current environment (e.g., COVID-19). The grouping of topics under the environmental cluster is predominantly focused on *industry, coercive pressure* and *general external factors.* In other words, this grouping only partially resembles the research model as such factors as *mimetic* and *normative pressure* as well as *fashion setters* are absent from the text-mining analysis.

Thus, based on the topics and keywords identified, there is an apparent prevalence of *industry* as a factor through such topics as CLIMATE CHANGE, REAL ESTATE, and BANKING SERVICE. Although during the interviews and analysis stage *industry* as the TOEI-MI factor was not supported by the majority of the participants, this does not mean that industry has no impact on the adoption of open innovation practices. On the contrary, industry can have a negative impact that forces individuals to think outside of the box and go against the flow. This was demonstrated in the qualitative representation of findings earlier in this chapter in subsection 5.3.3 by P3. In addition to the results obtained during the qualitative data analysis, we can also observe a confrontation between traditional industries that do not want to change and newly emerging industries that disrupt these traditional industries. For instance, under the topic REAL ESTATE we can observe such keywords as *traditional, real estate* and such keywords as *crowdsourcing, data, and platform*. These two groups of keywords demonstrate the contrast between established (old) norms and disruptive (new) ideas. In fact, two participants (P3 and P10) who represent PropTech indicated that their industry (real estate) is very outdated when it comes to opening up to new data solutions and external partnerships, which is the reason why these two participants adopted OI practices for their start-ups.

Additionally, it is interesting to note that within this cluster analysis *reputation* as a factor came under the environmental context. Based on that it can be suggested that reputation is a multilevel variable (see Table 5.2 for this) that can impact not only on the adoption of open innovation practices, but at the same time adopting parties are concerned about how bad actors will impact on their own image in the eyes of society. From this angle, the text-mining results supported the earlier claim about reputation as a multi-level factor, as demonstrated in section 5.3.1 of this chapter.

To sum up, the results of the text-mining exercise for the environmental cluster support the earlier findings made during the qualitative analysis. Neither the qualitative nor the text-mining findings supported the impact of fashion setters and mimetic pressure, whereas the impact of government pressure was found to be significant. As for industry, while the qualitative data analysis supported its negative impact, our text-mining results demonstrated how industry can have a reverse effect. Finally, the qualitative findings confirmed the impact of normative pressure, whereas in the text-mining exercise normative pressure can be seen as a broader aspect of reputation.

Individual Cluster

As can be seen from Table 5.6, the topics derived for the individual cluster from the text-mining program are somewhat reflective of those proposed in the research model. In particular, the software results emphasise the role of *international experience* with such keywords as *global, region, China, point of view, UK, Asia*, stressing the relevance of international experience as a factor; and *self-directed,* with such keywords as *learning, research, answer, learn,* which emphasises the learning aspect that is needed to drive adoption. At the same time *managerial tenure* as a factor was not derived by the software, which once again highlights its low relevance for the adoption of open innovation practices as was already established earlier in this chapter.

One topic that did not come up in the qualitative findings is the PERSONAL LEVEL. Under this topic there are such keywords as *leadership, personal, share,* and *personal level*. This could suggest that within the individual context one of the reasons why individuals introduce OI practices lies in the fact that they aspire to be good leaders among their peers and share their knowledge. For instance, P16, when asked about general individual factors that motivate his adoption, noted the following:

"For me again, it's transparency being a transparent leader, being able to understand what's going on. Also, communicating with my client base and my community."

From this perspective, the adoption of OI practices can be attributed to identifying the leaders who demonstrate motivation and eagerness to share their experiences.

Post-Adoption Cluster

Table 5.6 lists the topics that were derived by the text-mining software to analyse the post-adoption impact of open innovation practices on the participants. Although the qualitative findings confirmed the positive impact of OI adoption on the participants among three dimensions, *work engagement*, *work satisfaction* and *personal productivity*, the cluster analysis provides new insights.

Firstly, the topic APPROACH STAFF and the keywords linked to it imply that the adoption of OI practices challenges traditional approaches, which in turn impacts on staff. For instance, such keywords as *staff, mind, approach, traditional, requirement* contribute to this assumption. In addition, this assumption can be supported by the participants' own observations. For instance, P4 suggested:

"…before I used to get these notes and you know, by tomorrow, you've got to tell the staff that we're going to cut the salaries by 35%, for example, is a horrible conversation to have with people. But now I don't have that in the current company. It's more discussion. So that's fine because then I can understand the thinking behind it. I mean, we talk about user communities and I think the nice thing about COVID is it's made everybody in the US, China, the world, and talk to each other more. So we're now more of a family. I think that's one of the nice things that's come out this time. And it's also with, we mentioned university partnerships and it's nice now because we talked to the partners more."

P4 (Vice President/Education) has been working in industry for 18 years and before switching to the new organisation they worked in companies that did not adopt open practices. However, the new organisation is actively involved in external collaborations and recently introduced university partnerships and user communities to their business. Based on their previous experiences of working in closed organisations it can be stated that the adoption of OI practices changes individuals' mind-set and facilitates more discussions among employees and top managers, which in turn makes TMS have more of an open

approach to their subordinates. This is another example of the adoption of OI practices changing organisational structures as individuals are faced with different responsibilities. As discussed earlier in chapter 2 and the current chapter the changes in organisational structures are what differentiates management innovation from other types of innovation.

This leads to the second topic, which is IMPROVE PERSONALLY and the associated keywords. The appearance of this topic suggests that at the individual-level the adoption of the OI practices facilitates personal improvement among individuals or that is how it is at least perceived among the participants. This could be linked to the already discussed topic under the qualitative findings that the adoption of OI practices leads to an opportunity for personal growth (section 5.4.1 of this chapter) and it might imply that from the personal-perspective individuals feel better, because they are able to deliver better results. For example, P15 stated:

> *"…we put what we learned from those new things and if we put them into like ideas and come up with something which is more meaningful to our clients and improves the efficiency, and ultimately makes more money for our company".*

This statement on the post adoption impact not only offers the individual perspective, but also demonstrates how individuals who work for organisations link their personal improvement to organisational goals and efficiency. Although the qualitative findings suggested that the adoption of OI practices impacts on the participants' work engagement, work satisfaction, and personal productivity, the presence of IMPROVE PERSONALLY in the text-mining analysis suggests the general sentiment among the participants that comes with the adoption.

Open Innovation Practices Cluster

The following cluster that has been identified by text-mining software is related to open innovation practices and the benefits associated with their adoption as shown in Table 5.6. This cluster was not a part of the research model, but at the beginning of their interviews the participants were asked to discuss whether the adoption of OI practices has resulted in the expected benefits as described in section 4.4.4 of Chapter 4. Thus, from the one side the topics identified in Table 5.6 are somewhat similar to the discussion provided in section 5.6.2 of this chapter in such a way that the most frequent phrases represent the most used practices. For example, such topics as SUPPLY INTEGRATION, CONTRACTOR, BETATESTING FEEDBACK, VENTURE BETA, LICENSING REPORT indicate the distribution of practices among the participants in our study. Additionally, it demonstrates the nature of

certain open innovation practices. For instance, under SUPPLY INTEGRATION CONTRACTOR such keywords as supply, contract, contractor, supplier, integration, agency etc. directly describe the nature of supplier integration and contracting. This topic could also imply a full awareness by individuals of the nature of OI practices before the adoption happens.

From the other side the clustering analysis in Table 5.6 offers new insights around how certain open innovation practices can be attributed to certain areas only. For example, under the topic FIELD EXPERTISE such keywords as *university, partner, and collaborations* are linked to institutional collaborations, whereas such keywords as *field, expertise, knowledge* and *training* can be linked to the reasons for adoption. This is particularly evident in a response provided by P17 on institutional collaborations:

> *"I think we actually gained a lot from those collaborations, and still we are gaining. It's one of the big actually [sic] assets for the university, working with other institutions, other partners to get all the knowledge. And even attract some staff members like we needed highly professional like from the good universities like faculty members. So those partnerships work really well because other like new faculty and staff members who wanted to come to our university, they were actually recommended by these partnerships. So, we attracted a lot of them for their expertise and knowledge. We still work with them, but on a different level, because at the beginning they were actually our consultants, but right now we're working as full external partners."*

This statement provides evidence of the benefits that come with the adoption of OI practices. Additionally, it demonstrates how the OI practices can change after the adoption. In this particular scenario, we are able to observe how the application of external consultants was transformed to external full time partners. This transformation implies that the OI practices are not being abandoned after adoption, but can develop into higher level partnerships, which in turn impacts on the management structure.

Finally, such topics as AGENCY CREATIVE and PLATFORM INTEGRATE can be explained by the fact that this study had a higher concentration of professionals from advertising and the marketing industry (including MarkTech), i.e., N=6. Therefore, such keywords as *agency, planning, creative, data, network, tech* represent how open innovation is perceived among these participants.

Open Innovation and Management Innovation Cluster

The last cluster identified during text-mining analysis is attributed to open innovation and management innovation. Although this theme was not presented as a part of the qualitative data analysis, at the beginning of each interview participants were invited to talk about the operationalisation of management and open innovation in their organisations, if any (refer to section 4.4.4 of chapter 4). As can be seen from Table 5.6 only one topic was identified under this cluster, i.e., PROGRAM DEVELOP SOLVE. The keywords listed under this topic suggest that the application of either of the concepts is seen as a long-term program that is either applied as a solution or for commercial purposes. With regard to the first categorisation such keywords as *program, long-term, develop, opportunity, solve* could most likely be used to describe how the participants perceive management innovation. For example, P18 suggested:

> "*…we have something called a horizon program. And what the horizon program means is I am trying to build solutions, which could be business ready in the next two to three years. So, anything that is in the horizon of over 48 months that I have an idea in place, but the solution isn't available in the market yet. So, in this scenario it becomes a long-term bet where a start-up or multiple start-ups can be brought in order to work together, and this solution is built that way to be available in say 18 months' time, then it's tested internally, and the market value is proven. And then we go to the market. This solution is built from scratch, where 18 to 24 months of effort is invested for the company and multiple partners to jointly develop a solution. So, as far as the management innovation in my firm goes, these are the four ways (four programs), how would this be done and adequately at the beginning of every financial year, these four programs are evaluated and accordingly the budgets and the resources are modified."*

This statement offers important insights into how the adoption of OI is MI. Firstly, P18 (Open Innovation Manager/IT Services), who works on introducing various open innovation programs, perceives these programs as management innovation through collaboration with partners. Secondly, this statement suggests how the development of open innovation can be seen as a long term management innovation that is applied to provide solutions for internal organisational processes. This leads to the second categorisation of the keywords under the topic PROGRAM DEVELOP SOLVE: *deal, money, open innovation, commercial, invest*.

This group of keywords can be purely linked to the open innovation paradigm and how it is perceived among individuals. As already discussed earlier in this section under the relative advantage of the OI practices, the relevance of these keywords under this topic once again demonstrates financial awareness when it comes to adoption. In addition to that, it can also be stated that based on the text-mining results in Table 5.6 the participants in our study are more aware of the concept of open innovation than management innovation. Indeed, when talking about the operationalisation of management innovations in their organisations, participants mostly referred to such terms as development programs, leadership programs, hot desk policies and others. However, as was discussed in chapter 2 of this study, not all management practices can be considered as management innovation if they do not contain certain features. Some of the senior level participants acknowledged this differentiation as well. For instance, P22 stated:

> *"I think it is a difficult question (on the operationalisation of management innovation). Definitely I think internal restructures on roles and responsibilities, some of the roles are becoming redundant with the development of technology. It's not really changing the role of existing people, but actually hiring people who are more relevant on board. So for example, more tech savvy, rather than generalists would be one of the examples of management innovation. Other than that training on leadership, I'm not sure if it sits within innovation, but that's very much it."*

From this perspective, the clustering in Table 5.6 offers a different perspective on what management innovation is within the context of open innovation: *a long-term program that can be applied for commercial purposes in the form of open innovation*.

Table 5.6. Cluster analysis based on text-mining for TOEI contexts

THEME	TOEI factors (if any)	TOPIC	KEYWORDS	COHERENCE	FREQ	CASES
TECHNOLOGICAL	Relative advantage; benefits	**SOLVE CUSTOMER**	SOLVE; CUSTOMER; TODAY; ORDER; SCALE; START; PROBLEM; SOLUTION; LARGE; REQUIRE; PLAYER; SUCCESS;	0.493	307	21
	General	**PUSH OUR PRODUCTS FORWARD**	FORWARD; PUSH; INNOVATE; INTERNALLY; PRODUCT; PUSH	0.385	114	20

			OUR PRODUCTS FORWARD;			
	Compatibility; complexity	**PRACTICES** **COMPATIBLE**	STUDENT; COMPATIBLE; WORKS; UNIVERSITY; DECIDE; PARTNERSHIP; SUCCESSFUL; COMPLICATE;	0.371	81	16
	General; Compatibility	**ALIGN** **GROW**	ALIGN; CORE; GROW; HARD; FOCUS; PERSON;	0.365	53	20
	General	**CONVERSATION** **EFFICIENCY**	CONVERSATION; BOARD; REVENUE; EFFICIENT; PRICE; HAPPEN; LINE; SENSE; DEPEND; WIN; BRAND; COVID; COST;	0.363	107	20
	Relative advantage	**QUICKLY FAST**	QUICKLY; FAST; MANAGER; RESULT; CONTENT; CORE; PARTY; GREAT; HOUSE;	0.36	80	19
	Relative advantage; triallability	**RUN** **TRIAL**	RUN; DEMAND; TYPE; RESOURCE; TRIAL; PROVIDER; CUSTOMER; REVENUE; MONEY; FINANCIAL;	0.356	136	20
ORGANISATIONAL	General	**DEPARTMENT COLLABORATION**	DEPARTMENT; DIGITAL; SPACE; COLLABORATION; LONG; ONLINE; YEAR; AFTER; SPEND; EARLY;	0.398	133	22
	Size; culture	**SIZE** **OFFICE**	SIZE; OFFICE; COUNTRY; ADOPTION; ADOPT; EMPLOYEE;	0.381	127	22
	General	**PROCESS** **INTERNAL**	CALL; INTERNAL; PROCESS; SITUATION; STAGE; KEY; FOCUS; CONCEPT;	0.343	109	22
ENVIRONMENTAL	General external; Industry	**CLIMATE CHANGE**	CLIMATE; BANKING; WORLD; RISK; SPECIFICALLY; ACROSS; AI; INTELLECTUAL PROPERTY; TODAY; BANK; DIRECT; HAPPEN; PROVIDE;	0.443	178	21

			FINANCIAL; TALK; CLIMATE CHANGE;			
	Industry	**REAL ESTATE**	BUILDING; TRADITIONAL; CROWDSOURCING; STUFF; REAL; KEY; STAGE; DATA; PLATFORM; WRONG; THING; REAL ESTATE; EARLY STAGE;	0.381	145	21
	Industry	**BANKING** **SERVICE**	BANK; PAY; SERVICE; BUY; EXIST; ACCESS; INFORMATION; LICENSING; BANKING;	0.378	108	20
	Reputation	**EXTERNAL FACTOR**	REPUTATION; TRACK; EXTERNAL; WIN; REVIEW; PLAY; FACTOR; EXTERNAL FACTOR;	0.366	88	20
	Coercive Pressure	**GOVERNMENT REGULATION**	REPUTATION; TRACK; EXTERNAL; WIN; REVIEW; PLAY; FACTOR; EXTERNAL FACTOR;	0.356	110	22
	General external	**CLIMATE CHANGE**	PRICE; LONGER; CLIMATE; PAST; JOB; INTELLECTUAL PROPERTY; REPORT; MATTER; FINANCIAL; WIN; SIGN; CLIMATE CHANGE;	0.37	77	19
INDIVIDUAL	International Experience	**GLOBAL** **VIEW**	GLOBAL; POINT; HONEST; VIEW; UK; PLANNING; REGION; CHINA; TOOL; RESEARCH; POINT OF VIEW;	0.422	123	22
	Self-directed learning	**SYSTEM** **LEARNING**	OPENSOURCE; SYSTEM; LIVE; CHINA; LEARNING; RESEARCH; FOLLOW;	0.406	95	17
	International Experience; Self-directed learning	**ROLE** **LEARN**	ANSWER; LEARN; FUTURE; PAST; QUESTION; ROLE; LEARNING; DIRECT; ASIA;	0.378	89	21

	General factors	**PERSONAL LEVEL**	LEVEL; HIGH; LEADERSHIP; PERSONAL; SHARE; ACROSS; PART; PERSONAL LEVEL;	0.344	81	20
POST ADOPTION	General factors	**APPROACH** **STAFF**	APPLY; STAFF; MIND; APPROACH; TRADITIONAL; REQUIREMENT; THING; CORE; NECESSARILY; REPORT; PLAY; BANKING;	0.361	94	21
	General factors	**IMPROVE** **PERSONALLY**	IMPROVE; INSURANCE; HUMAN; POLICY; PERSONALLY;	0.368	44	13
OI PRACTICES and BENEFITS	Types of open innovation practice	**SUPPLY INTEGRATION CONTRACTOR**	SUPPLY; CONTRACT; CONTRACTOR; SUPPLIER; INTEGRATION; AGENCY; BRING; SUPPLY INTEGRATION; SUPPLIER INTEGRATION;	0.493	171	19
	Types of open innovation practice	**BETATESTING FEEDBACK**	BETATESTING; LAUNCH; TESTING; FEEDBACK; BETA; TEST; OUTSOURCE;	0.428	142	17
	Types of open innovation practice	**VENTURE BETA**	VENTURE; BETA; COMMUNITY; CROWDSOURCING; TESTING; USER; INTEGRATION; PARTY; PROVIDER; PARTY INTERMEDIARIES;	0.428	102	19
	Reasons to adopt	**FIELD EXPERTISE**	FIELD; EXPERTISE; UNIVERSITY; BEGINNING; PARTNER; KNOWLEDGE; COLLABORATION; TRAINING;	0.422	122	17
	Types of open innovation practice	**AGENCY** **CREATIVE**	BRAND; MEDIUM; PLANNING; TECH; AGENCY; CREATIVE; AREA; NETWORK;	0.406	100	16
	Types of open innovation practice	**PLATFORM INTEGRATE**	PLATFORM; FEATURE; MARKETING; DATA; MEDIUM; MENTION; GOOGLE;	0.388	186	20

			INTEGRATE; CLIENT;			
	Types of open innovation practice	**LICENSING** **REPORT**	WRONG; SHOW; LICENSING; NUMBER; LICENSE; REPORT; COUPLE;	0.377	57	15
OPEN INNOVATION and MANAGEMENT INNOVATION	General	**PROGRAM** **DEVELOP** **SOLVE**	PROGRAM; LONGTERM; DEAL; MONEY; DEVELOP; OPPORTUNITY; SOLVE; OPENINNOVATION; HOUSE; FORM; COMMERCIAL; INVEST;	0.36	156	22

5.7 SUMMARY

This chapter has presented the findings obtained as a result of the qualitative data collection. The findings in this chapter were presented in three parts. In the first part, this study presented a typology of the OI practices as MI. In the second part, this study demonstrated how, based on the answers obtained, the propositions of this study were either supported or rejected. To summarise, the technological and the organisational/cultural contexts of the TOEI-MI framework were fully supported, whereas the factors from the environmental and the individual contexts were not fully supported. Additionally, a few new factors were discovered, e.g., the reputation of external partnerships. The post adoption impact of the OI practices was supported across all three dimensions proposed and it was identified that the adoption of the OI practices transforms individuals' jobs.

The second part of this chapter showed the findings obtained as a result of a text-mining exercise. This step was undertaken to supplement and expand the findings obtained from the first part of this chapter. The text-mining findings highlight the human aspect of both management and open innovations through a term frequency analysis. While the text-mining analysis results somewhat supported the findings obtained during the qualitative analysis stage, it also made it possible to identify a new factor under organisational context, i.e., *office layout*. Finally, the text-mining analysis helped to expand the discussion around the research model. For instance, the text-mining results obtained for the technological context highlighted the importance of the relative advantage of the OI practices and discovered the financial aspects of the adoption process.

The next chapter of this study will present a discussion based on the findings obtained in this chapter.

CHAPTER 6. DISCUSSION

6.1 INTRODUCTION

Chapter 6 presents a discussion based on the findings introduced in the previous chapter of this thesis. This chapter mainly focuses on understanding how the findings obtained answer the research questions and objectives outlined in chapter 1 of this thesis. At the same time, it analyses how this study's findings compare with the existing body of literature. Thus, this chapter is structured around three areas. Firstly, it provides a discussion on the concepts of management and open innovation. Secondly, it discusses the factors that impact on the adoption of OI practices as MI. Thirdly, it finishes with a discussion on the post-adoption impact of the OI practices as MI on individuals and their work-related performance.

6.2 ANSWERING RESEARCH QUESTION 1: WHAT IS THE CONCEPTUAL RELATION BETWEEN THE OPEN INNOVATION PARADIGM AND MANAGEMENT INNOVATION?

This study's first objective was to establish the research link between the concepts of open innovation and management innovation and to understand to what extent open innovation related activities, in our usual understanding, can be conceptualised and applied as a form of managerial practice. To answer this research question and fulfil the first research objective, we need to go back to this study's origins. This study was built on the premise that as an activity open innovation and its practices demonstrate the same characteristics as management innovation, and as such, it claims that the application of and participation in open innovation practices is a form of management innovation (see chapter 2, section 2.3.2 of this study for a side-by-side comparison). To recap, the four characteristics used in this study are *implementation, the exhibition of novelty, alteration of the management work, the intention to further organisational goals* as per Birkinshaw et al. (2005), Mol and Birkinshaw (2008), Mol and Birkinsahw (2009). So, to what extent do the findings of this study support or reject this claim?

Our study's empirical results could support the first objective across the three characteristics of MI: *the exhibition of novelty*, *alteration of the management work*, and *intention to further organisational goals*. The only characteristic that this study could not compare against is *implementation*. The possible explanation may lie in the fact that implementation requires a

pre-adoption examination of the environment, meaning that innovation has to be implemented in a different organisational setting. In our study, the participants were on a high or low spectrum of adoption instead of adopters and non-adopters. On this note, Damanpour (2014) states that most innovation studies consider adoption to be a dichotomous process (adopted/non-adopted), but the adoption process consists of three phases- initiation, adoption decision, and implementation. Thus, the time it takes for implementation to happen makes it difficult to assess the impact (Damanpour, 2014). Due to time limitations and methodological considerations, this study could not investigate in detail the process of the implementation of innovations. On the other hand, the participants in our study rejected the impact of mimetic pressure, yet they confirmed that they track their competitors and try to understand what the competitors are implementing, but the adoption of the OI practices remains unique to each of the cases. This claim suggests that the OI practices could potentially include the implementation as per Birkinshaw et al. (2005), Mol and Birkinshaw (2008), Mol and Birkinsahw (2009); however, a further empirical investigation is needed. As for the remaining three characteristics, the following is suggested.

Firstly, *the exhibition of novelty*. In our data sample, 12 participants indicated that the global situation in 2019/2020 (COVID, Brexit, and social movements) as an external factor pushed them either to completely switch their business model to an open model or adopt novel open innovation practices and abandon old ones by staying within the existing model. In particular, the first scenario was discussed by P8, P19, and P22: all three participants adopted outbound OI practices as an entirely new way of working to move from old ways of doing business. According to Birkinshaw et al. (2005), the adoption process of a management innovation must be new to an adopting organisation, and its adoption must be justified and involve a certain level of risk. From this perspective, the participants justify OI's adoption due to global uncertainties and changing market landscape, mainly due to the global pandemic, as discussed earlier. Additionally, some of our participants could not discuss the benefits as they are still in the early stage of adoption (e.g., P8, P19, and P22), and as such, they are still at risk of not making any profit or failing. From this side, the adoption of OI practices is associated with risks attributed to new management innovation.

Secondly, *alteration of the management work* is perhaps the most significant insight that arises from this study, as it confirms the managerial nature of open innovation practices. According to Birkinshaw et al. (2005) and Mol and Birkinshaw (2009), MI's adoption has to change and improve the managerial work structure. Our study empirically demonstrated that

the adoption of some of the OI practices alters the structure of managerial practices and processes by freeing up their time, reallocating their tasks, and allowing them to move from repetitive tasks to more senior strategic execution. Primarily, this characteristic of MI was attributed to the relative advantage of OI practices. In particular, as was demonstrated in section 5.4.1 of chapter 5, the participants explained that at the individual level, the adoption of OI practices provides them with more free time, which contributes to their improved work routines. As a result, most participants pointed out that a significant outcome of OI adoption is associated with their personal growth and new skills development because the adoption freed up their time. This outcome signifies a transition from the old role to a new role, further contributing to changes in organisational structures. From this perspective, our study shares similar conclusions with Guzman and Espejo (2018), who analysed voice behaviour in relation to management innovation. In their study, Guzman and Espejo (2018) argue that collaborative discussion of ideas leads to the implementation of management innovation and changes in practices, processes, and structure.

Interestingly, although Guzman and Espejo (2018) studied voice behaviour, the focus on collaborative ideation is closely related to the concept of open innovation. Similarly, our study's findings demonstrate that some of the participants feel more engaged in their work because participation in open innovation activities makes them feel part of the community (section 5.5.2 of chapter 5). Altogether this suggests that the OI practices can be not only applied with the intention of technological or product advancement as has been historically studied but also to enhance and alter managerial work.

Thirdly, *the intention to further organisational goals*. The participants in this study, some of whom are CEOs and co-founders, can confirm that since the adoption of the open innovation practices, they are able to see the expected benefits not only for their organisations but also for their employees. This last point is essential because our post-adoption analysis confirms the improved well-being of the participants (section 5.5. of chapter 5). As a result, the outcomes of this characteristic are in line with Birkinshaw et al. (2005), who state that the adopted management innovation practices not only enhance the organisational performance (in some cases, it might not, e.g., case of Volvo) but should also target its employees. To support this point of view, Walker et al. (2015) suggest two types of performance associated with the adoption of MI: economic and noneconomic gain. Under noneconomic gain, Walker et al. (2015) identify such metrics as employee retention, client satisfaction and others. A clear example of employee retention as a result of the OI adoption was discussed by P22,

who stated that in their organisation, they are able to retain more talent because the implementation of OI practices reduces the amount of repetitive work, and employees can focus on delivering something unique. As for organisational goals, the participants in this study stated that the adoption of the OI practices enhanced the organisational performance in revenue either by reducing the costs through the application of such OI practices as outsourcing and beta-testing or helped to increase revenue since the implementation of outbound OI practices helps these organisations to offer more innovative solutions and better services, i.e., economic gains (Walker et al., 2015). For example, the external commercialisation of the IPs was considered by some participants as an additional stream of revenue (e.g., P19, P22).

Furthermore, the results of our study are also able to contribute to the operational definition of MI as per Birkinshaw et al. (2008), as outlined in section 2.2 of chapter 2 of this study. Firstly, *what is being innovated?* Our findings show that adopted OI practices innovate managerial practices, processes, techniques and structures, i.e., operational level rather than abstract level or abstract management idea as per Birkinshaw et al. (2008). Secondly, *how new is innovation?* Although in this study we tried to focus on the "new to the firm" aspect of MI, our findings demonstrated that some OI practices could be considered as "new to the state of the art" MI. For example, in some cases (e.g., P8, P9, P19), it was shown that participants had to transition to new business models. This transition was driven by external factors such as COVID-19 or climate change. Lastly, *what is the purpose of innovation?* In our study, the findings demonstrated that the OI practices as MI are applied under cultural, institutional and rational perspectives, with the last two highlighting its long-term impact.

Thus, with regard to the first research question, this study can propose the following answer. *The open innovation, that is the process of opening up, is related to management innovation in such a way that the application of and participation in open innovation practices is a form of managerial practice since it produces the same adoption outcomes as what is expected from a management innovation.* The first objective of this study also provides timely support to a recent discussion on the open innovation paradigm by McGahan et al. (2020) published in the California Management Review. The authors suggest that our understanding of open innovation needs to go beyond its traditional application for financial needs and creating value; instead, we should focus on how to apply the open innovation paradigm to solve business and societal issues. In particular, the authors refer to the open innovation definition provided by Chesbrough and Bogers (2014), which views open innovation as purposive

management. To recap, *"Open innovation is a distributed innovation process based on purposively managed knowledge flows across organisational boundaries, using pecuniary and non-pecuniary mechanisms in line with each organisation's business model."* (Chesbrough and Bogers 2014, p.17). From this point, the empirical findings of our study move the discussion forward as they clearly demonstrate that open innovation practices can be applied with the purpose of enhancing managerial work.

6.2.1 TYPOLOGY OF OPEN INNOVATION AS MANAGEMENT INNOVATION

In addition to establishing the research link between the concepts of OI and MI, our findings were also able to identify the similarities between the open innovation cases in our study and the typology of MI generated by Gebauer et al. (2017). To recap, three of these types were identified in our study, which is in line with the findings of Gebauer et al. (2017). These three types are *externally-recommended OI as MI*, *efficiency-driven OI as MI*, and *opportunity-oriented OI as MI*. In addition to these three types, there is a fourth type, which is a mix of *efficiency-driven* and *opportunity-oriented OI as MI*.

The only type of OI that the study could not identify *is problem-oriented management innovation*. According to Gebauer et al. (2017), this type of management innovation emerges when internal change agents create an entirely new practice rather than an "off-the-shelf" practice in regard to a specific problem. This type of management innovation cannot be done in an ad hoc manner, and it requires a significant adaptation of existing practices. The generation and implementation of this type of MI is quite a complicated process because it involves a lengthy trial process in which internal change agents need to exchange knowledge about the problems with external partners. The external change agents play a significant role in this process because, without their participation in a trial process, the adoption may fail. Another challenge associated with this type of MI is the fact that organisations have to understand how problems disrupt their productivity. This suggests that the identification of this type of MI needs a longitudinal study because the process of creating this type of MI is lengthy and requires output from external collaborators. Our study, however, was focused only on internal change agents and it has time constraints. Thus, similarly to the implementation of MI, as outlined earlier, the identification of problem-oriented management innovation was not possible in this study. Another possible explanation for this lies in the fact that the majority of the OI practices analysed in this study already exist in different organisational settings (e.g., OSS, crowdsourcing, outsourcing etc.), and as such, the

invention of an entirely new practice is not required. As for the remaining typology, the following is suggested.

Firstly, *externally-recommended OI as MI*. In our study, this type of OI was identified among two participants only (2 out of 22 cases), whereas Gebauer et al. (2017) identified this type of MI as the most popular in their study (7 out of 18 cases). This discrepancy can be explained by the fact that externally recommended MI are proposed by external agents rather than internal agents. External change agents then drive the change and stand behind the invention process, whereas internal change agents are accountable for its implementation. In our study, and similarly to the reasons outlined above, the sampling population consisted of individuals within organisational boundaries. Thus, assessing to what extent external change agents facilitate the emergence of this type of OI is quite problematic. In addition, the majority of the participants in our study did not support the impact of fashion setters, while Gebauer et al. (2017) state that externally recommended MI are often fashionable practices. Accordingly, based on Birkinshaw et al. (2008) and Volberda et al. (2014), within the management fashion perspective, management innovation is proposed by external change agents, who can be consultants, academics, top managers. Our study, however, did not support the idea that open innovation is management fashion.

Secondly, *efficiency-driven OI as MI*. In our study, this type of OI was identified among ten participants. Similarly, Gebauer et al. (2017) classified this as the second most popular type of MI in their research. The popularity of this type of OI as MI can be explained by the fact that this type of MI is driven by internal change agents based on the observations concerning inefficiencies in their daily work. Internal change agents then reach out to external change agents to consult them on "off-the-shelf" practices that can improve their work. The internal change agent is responsible for implementing practice in their organisations, while external change agents are only involved to a certain extent. Likewise, our study sampling frame was focused on internal change agents who are responsible for the performance of their subordinates, e.g., senior managers, directors, VPs, head of department, CEOs and co-founders. Thus, the practices they adopt have to solve the inefficiencies that occur in their daily work. As such, the practices that prevail in this type are mostly related to inbound OI, for example, beta-testing, outsourcing etc. Since the studies on how OI benefits individuals are limited, we have to look at existing research that analyses the organisational level outcomes. At the organisational level of analysis, it is suggested that the application of inbound open innovation practices is beneficial, as organisations can benefit from the

knowledge and experience of their external partners in order to enhance their own innovations (Parida et al., 2012). From this perspective, the results of our study suggest the same reasoning at the individual level when it comes to efficiency-driven OI. The identification of this type of OI may also be beneficial for OI managers as it provides an alternative perspective on OI adoption, with past research mainly being focused on organisational level outcomes and benefits.

Thirdly, *opportunity-oriented OI as MI.* In our study, this type of OI was identified among five out of 22 participants. It is interesting to note that Gebauer et al. (2017) found this type of MI only in two cases. This type of MI is driven by an opportunity search rather than by problems. In other words, internal and external change agents have to recognise a need for new opportunities. This type of MI is created in a symbiosis between internal and external change agents, with internal change agents implementing practices and external change agents assisting them in this process. The reason why this type of OI was identified among quite a few participants can be linked to the presence of start-ups in our data sample. On the other hand, Gebauer et al. (2017) suggest that their study lacks the representation of start-ups. In fact, and as demonstrated in section 5.3 of chapter 5, this type of OI mainly prevailed among founders and co-founders. Additionally, this type of OI is dominated by outbound OI. Here, Hu et al. (2015) explain that in the context of outbound OI (out-licensing, in particular), this activity is related to the desorptive/ sensing capacity of dynamic capabilities. In other words, organisations that practise outbound OI demonstrate sensing capacity because they need to recognise potential market opportunities to out-license their IP, then apply the seizing capacity to turn into these into opportunities, followed by transforming capacity that rearranges organisational processes. Similarly, a study by Lin et al. (2016) confirms the positive and significant impact of sensing dynamic capabilities on the process of management innovation. While this process describes how organisations apply OI within the dynamic capabilities theory as per Teece (2007), the results of our study describe an individual reasoning behind such decisions, as called for by Lin et al. (2016). While Birkinshaw et al. (2008) and Lin et al. (2016) suggest that at the macro-level, the need for management innovation comes from the identification of a new problem, our study demonstrates that it can be linked to creating opportunities from the individual perspective. As a result, individuals (founders, CEOs) look for managerial practice relying on their sensing capability and they actively consult with external agents, which increases their awareness of relative advantage,

triallability, compatibility and other innovation characteristics of opportunity-driven open innovation.

Finally, *efficiency-driven and opportunity-oriented OI as MI.* In our study, this type of OI was identified among five participants. This type is rather an aggregation of the original typology developed by Gebauer et al. (2017). As demonstrated in section 5.3 of chapter 5, this type of OI is equally split between the participants that represent large and SME organisations in our data sample. The emergence of this type of OI in our study can be explained by the fact that some participants practise both inbound and outbound types of OI, and as such, they may apply both practices to address inefficiencies and generate opportunities.

The revelation of this typology for open innovation provides an exciting perspective on their antecedents not only from the individual perspective but also from the management point of view.

The above discussion paves the way for the following research question on how open innovation practices as management innovation can be adopted and optimised.

6.3 ANSWERING RESEARCH QUESTION 2: WHAT FACTORS IMPACT THE ADOPTION OF OPEN INNOVATION PRACTICES AS A FORM OF MANAGEMENT INNOVATION?

The second objective of this study was to investigate a list of factors that impact on the adoption of open innovation practices as management innovation. Mainly, this section is focused on presenting the individual level perspective, demonstrating what the adoption of OI practices means for the participants and how it alters their experiences. In order to fulfil this objective, this study applied the TOEI-MI framework. While the TOEI framework allowed us to examine the adoption process in a systematic manner by focusing on individuals as a unit of analysis, the MI perspective allows us to make it more suitable for the MI context. The empirical findings obtained demonstrate that all four contexts/perspectives of the TOEI-MI framework were found to be significant in some or another. In other words, our study highlights the importance of the technological characteristics of the open innovation practices as management innovation on their adoption as well as showing that the adoption of the open innovation practices is not a management fashion; instead, this decision may be driven by cultural, institutional, and rational choices. From this perspective, the results of our study

provide an integrated framework that can help managers to understand when and how to adopt which open innovation activities, as suggested by Huizingh (2011).

The following subsections of this chapter will provide a detailed discussion of how our findings relate to the existing literature.

Technological

The empirical findings of our study indicate that the awareness of innovation characteristics of open innovation practices as a form of management practice increases the chances of their adoption. The practices that are not compatible with the organisational values, which are too complex to implement, which do not provide free trials, and which do not result in the expected benefits have fewer chances to be adopted. Lin et al. (2016) argue that the awareness of innovation characteristics of management practices (relative advantage, complexity, compatibility, and observability) is built upon sensing capability of the dynamic capabilities perspective. Based on this, our empirical results are consistent with the management innovation literature in that this study also confirms the critical role of relative advantage on the adoption, in line with Damanpour and Schneider (2009) and Khosravi et al. (2019). Damanpour and Schneider (2009) analyse the adoption of administrative (management) innovations at the organisational level, and relative advantage of new administrative innovation in their study was considered as an improved innovation cost unlike before. The results of our study, however, indicate that from the individual perspective, the relative advantage is the time impact that comes with the adoption, meaning that employees do not need to spend time on repetitive tasks and focus on strategic execution, as was discussed in section 5.4.1 of chapter 5 (e.g., P21).

Scholars state that for a successful implementation of new management practices, a trial-and-error process is required (Birkinshaw et al., 2008; Mol and Birkinshaw, 2009). Similarly, the role of triallability as an adopting factor was confirmed by the participants in our study when talking about such open innovation practices as external partnerships, vendors, third-party intermediaries, contractors and other types of inbound OI. As for complexity, the findings of our study contradict Damanpour and Schneider (2009), who found a nonsignificant effect of innovation complexity on its adoption. This contradiction can be explained by the fact that, in this study, we analysed a number of open innovation practices that vary in their nature rather than focusing on a particular type of management innovation, as in the case with Damanpour and Schneider's (2009) study, which analysed only administrative innovations in public

organisations. Participation in open innovation requires individuals to interact with external agents and partners, which involves building and investing in complex human relationships, which might not be successful in the short term. Thus, any type of misunderstanding, regional and cultural differences between an adopting party and an external partner will result in failure.

As for the rest, the management innovation literature offers little or no empirical evidence with regard to its innovation characteristics (Khosravi et al., 2019). From this perspective, our study provides a timely response to Simao et al. (2020), who state that we can only assume that the management innovation characteristics can influence its adoption. Our study empirically demonstrates how the innovation characteristics of open innovation practices impact their adoption in the eyes of employees.

As for the open innovation literature, the innovation characteristics of open innovation were investigated by Hwang (2019), who found the technological context to be an essential dimension for its implementation, as well as by Zhang et al. (2017), who studied an application of open innovation in China's public sector and demonstrated the significance of the technological context. The study by Hwang (2019) applies the TOE framework, yet it has a slightly different focus, i.e., the author investigates such technological factors as complementarity, compatibility and the IP protection of open innovation practices through focus groups and an application of the AHP principle to identify critical factors, whereas the study by Zhang et al. (2017) focuses only on such technological factors as IT infrastructure, personnel IT access and competence through a case study. Although all three studies, our study, the study by Zhang et al. (2017) and the study by Hwang (2019), investigate different innovation characteristics and apply different methodologies, at the same time, they show the diversity of the innovative characteristics of open innovation practices and highlight the importance of these characteristics for their adoption process.

Overall, it is, however, quite problematic to generalise our findings in the open innovation literature because a) there are no other studies that investigate the innovation characteristics of open innovation in the same manner except the studies offered above; b) the open innovation paradigm incorporates many activities across a few dimensions (inbound, outbound and coupled), and as such it is not feasible to analyse the innovation characteristics of them all; c) it has long been noted that the open innovation scholars investigate cases in

which open innovation has already been adopted and thus exclude scenarios where the adoption is intended or failed (e.g., Lichtenthaler, 2011; Gao et al., 2020; Tucci et al. 2016).

Based on the discussions above, this study makes a significant move forward both for the management and open innovation research domains because it analyses the whole spectrum of the innovation characteristics as per Rogers's (1995) Diffusion of Innovation Theory and empirically demonstrates its significance for the adoption. For example, given the various types of open innovation practices, further research might want to investigate the adoption of crowdsourcing or open innovation platforms as management innovation within Rogers's Diffusion of Innovation Theory because these types of open innovation practices share the same features of technological innovations, which have been widely studied by the TOE researchers.

Organisational and Cultural

The empirical findings reveal that the size of an organisation, top management support, and organisational culture are all significant factors when it comes to the adoption of open innovation practices as management innovation.

When it comes to organisational size, our findings are consistent with both the MI and OI literature in that size remains one of the most studied and essential characteristics in both domains, yet its impact is unclear (Bigliardi et al., 2020; Huizingh, 2011; Khosravi et al., 2019). From this perspective, our findings contribute to that stream of literature that suggests that the smaller the organisation is, the more likely it is that an innovation will be adopted due to less bureaucracy being involved, as was indicated by our participants. In the MI literature, our findings are in line with Ozturk and Ozen (2020) and Vaccaro et al. (2012), who support the positive moderating effect of small companies on management innovation. Additionally, Prasad and Junni (2016) suggest that in small organisations the interaction between top managers and employees happens more often, which contributes to the adoption of new managerial practices, which was also brought up by the participants in our study. Similarly, in the OI literature, it has long been suggested that small companies are increasingly adopting the OI practices as they are more responsive to such changes due to their size (e.g., van de Vrande et al., 2009). SMEs are able to take risks because of their agility, they demonstrate lower levels of bureaucracy (Dufour and Son, 2015), and they adopt open innovation to survive and to compensate for the lack of strategic resources (e.g., Bigliardi and Galati, 2016; Gassmann et al. 2010). Although in our study we did not mainly focus on SMEs and small

organisations rather we investigated organisations of different sizes; the focus on individuals allowed us to obtain their perspective with regard to organisational size. As a result, based on their previous work experience, the participants in our study also support the idea that the smaller an organisation is, the easier it is to adopt OI practices. In general, participants agreed that in small organisations, there is less bureaucracy involved and, as such, employees feel more open to suggesting their ideas and participating in the adoption. On this note, Gustafsson et al. (2001) suggest that because in small Swedish organisations each employee's contribution is equally important, employees feel more engaged and committed when it comes to the adoption of quality systems (management innovation). Specifically, this pattern was observable among group participants that represented CEOs and co-founders, as discussed in section 5.4.2 of chapter 5 (e.g., P8). This logic can be explained by the fact that in small organisations CEOs more often engaged with employees (Miller and Toulouse, 1986).

With regard to top management support, our results are in line with both the MI and OI literature because this factor has been studied extensively in both domains, e.g., MI (Kam Sing Wong, 2013; Montes et al., 2005; Ravichandran and Rai, 2000; Rezvani et al., 2017) and OI (e.g., Bhatti et al., 2021; Brunswicker and Chesbrough, 2018; Huizingh, 2011; Zhang et al., 2017). From this perspective, our findings complement existing studies by highlighting the role of top management support. Particularly, the individual perspective emphasises the importance of having an open-minded TMS. Here, the results of our study agree with those by Ahn et al. (2017), who discuss the role of the CEO's positive attitude to openness as one of the micro foundational factors that impact the adoption of OI.

According to Zynga et al. (2018), the role of top management is essential not only because of the support but also because top management creates the organisational vision that supports the implementation of open innovation among employees. This vision forms part of an organisational culture, which in turn defines how individuals will adopt open innovation. According to the cultural perspective of MI, as per Birkinshaw et al. (2008), organisational culture is the key influencing factor that impacts the adoption process of management innovation from the perspective of individuals who engage in the adoption process. Organisational culture as an adoption factor was supported in our study by the overwhelming majority of the participants, which suggests a cultural perspective on open innovation. From this perspective, the results of our study are in line with and contribute to the MI literature (Alofan et al., 2020; Babatunde and Sui Pheng, 2015; Gallear and Ghobadian, 2004, Prajogo

and McDermott, 2005) and the OI literature (e.g., Kratzer et al. 2017; Szymańska, 2016). Although in this study we cannot confirm whether the adopted OI practices challenge the status quo as per the cultural perspective of MI (McCabe, 2002) (a longitudinal study will be needed for that), a group of participants in our sample implied that their organisational culture is open, flat in structure, top management communicates the ideas well and leads by example, which is what makes the introduction of the OI practices possible, as discussed in section 5.4.2 of chapter 5.

Environmental

The empirical findings indicate that normative and coercive pressures are considered to be significant factors for the adoption of OI practices as MI. Both of these factors represent the institutional theory, as per DiMagggio and Powell (1983). Thus, our findings complement the existing studies that analyse the adoption of MI within the institutional perspective (Birkinshaw et al., 2008; Damanpour, 2014; Volberda et al., 2014). Additionally, our findings are also consistent with those of Radnejad et al. (2017), who analysed the impact of coercive and normative pressures on the implementation of open innovation in the oil industry.

In our study, it was identified that particular government and non-government policies impede or define what open innovation practices can be adopted, e.g., GDPR in Europe. From this perspective, our findings shed light on the extent to which policies can facilitate open innovation (Bogers et al., 2018a) and, in particular, how this process happens in different regions (Gao et al., 2020). For example, coercive pressure, in a form of GDPR in this study, can prevent CEOs of a small organisation from adopting open practices in some regions, as was discussed in section 5.4.3 of this study by P2 and other participants, which in turn can damage such strategically important industries as healthcare. On this note, Chesbrough (2020) calls for countries and governments to open up to fight against COVID-19, but, as our results show, strict regional policies make this a very challenging task. This can create a future imbalance in how open innovation practices can be diffused in Western and Eastern societies. In fact, the participants that represented the APAC in our data sample indicated that they find it easier to adopt certain open innovation practices in Asia rather than in Europe, e.g., contracting, as discussed by P3 in section 5.4.3.

As for normative pressure, the results of our study confirm its importance to the participants. In particular, the participants discussed the role of normative pressure as a motivation factor that challenges their organisations to benchmark their business. This finding means that

employees and TMS will demonstrate more interest in adopting and improving their personal managerial practices under conformity pressures. Thus, while coercive pressure was mainly found to be a barrier, normative pressure demonstrated a different effect at the individual level. In the same vein, the study by Radnejad et al. (2017) considers normative pressure a driver for OI adoption in the oil industry. From this perspective, our individual-level findings explain the diffusion of OI practices in the same way as organisational-level findings.

Unlike coercive and normative pressures, mimetic pressure was rejected as an external adoption factor by the majority of our participants. Although the institutional perspective on MI supports this factor, e.g., diffusion of TQM (Abrahamson and Rosenkopf, 1993) or a study by Ansari et al. (2010) that confirms the adoption through imitative behaviour, the rejection of this factor in our study can be explained in the following way. In the open innovation literature, IP management and its protection lie at the core of the inbound and outbound OI activities (Dahlander and Gann, 2010; Grimaldi et al., 2021), and it helps organisations to sustain their competitive advantage, whereas imitation is seen as a barrier to the adoption of open innovation practices (Bigliardi and Galati, 2016). Even though, some participants in our data sample want to imitate their competitors, the defensive strategy applied by competitors on their IPs makes it quite challenging. Another possible explanation lies in the fact that our study used such 'key informants' as CEOs, co-founders, managing directors and others and, as such, they may not feel comfortable acknowledging imitative behaviour. Thus, in our sample, the majority of participants adopt the open innovation practices because they believe it corresponds with their organisational DNA. Thus, imitating competitors to adopt open innovations as a managerial practice is not considered an option for them.

In a similar vein, the industry as an external factor was not supported in our study. This finding is in line with Mol and Birkinshaw (2009), who imply that industry is not a defining factor when it comes to the adoption of individual management practices. Furthermore, a study by Nieves et al. (2015) finds that in the hotel industry, the adoption of management innovation is not related to tourist industry agents and call for more studies to analyse the impact of different economic sectors on MI. From this perspective, our findings complement this existing knowledge on the relation between industry and the adoption of MI.

On the other hand, this finding contradicts the general notion of the industry as a facilitating factor in the open innovation literature (Huizingh, 2011). This contradiction can be explained

in the following ways. Firstly, historically open innovation scholars studied the paradigm in high-tech industries with R&D departments, and only recently, did they turn their attention to other industries (Bigliardi et al., 2020). The data sample in this study is not focused on a particular type of industry; rather, it is focused on different types of industries and companies of different sizes that do not have centralised R&D departments. Secondly, the continuous technological advancement led to the emergence of many new subindustries, which are very well represented in this study by start-ups, e.g., MarkTech, AdTech, EdTech, as demonstrated in section 5.2 of chapter 5. Despite the popularity of the open innovation research, there are still not enough empirical studies on such kinds of start-up (Gao et al., 2020). The emergence of these new industries has created an exciting avenue of research. On the one hand, we have traditional industries such as real estate and education, where organisations are still quite conservative and managed in traditional ways, and on the other side, we have satellite industries that are forced to innovate against traditional industry standards to create novel ideas that are used by the traditional industry players. As a result, the industry can have a reverse effect, which was demonstrated in sections 5.4.3 and 5.6.3 of chapter 5. From this perspective, our findings stress the importance of analysing the implementation of the OI practices in newly emerging industries.

Finally, open innovation is not a management fashion, as the empirical findings of this study suggest. The participants in our study stated that they do not adopt the open innovation practices under the influence of the "fashion-setters". In the fashion perspective of management innovation, it is assumed that new managerial practices emerge and spread under the influence of the "fashion setters", who persuade their followers to join them in their beliefs (Abrahamson, 1991; Abrahamson, 1996; Abrahamson and Fairchild, 1999; Birkinshaw et al., 2008; Damanpour, 2014; Volberda et al., 2014). A typical management fashion practice will arise at a certain point, only to fall short after a few years (Abrahamson 1991; Piazza and Abrahamson, 2020). For instance, such management practices as TQM, BPR, Six Sigma and others are considered to be management fashions (Wright et al., 2012). This contradiction with the MI literature can be supported by the fact that organisations continue to adopt open innovation. For example, a study by Brunswicker and Chesbrough (2018) finds that the number of large companies that adopt open innovation increased over time, and companies do not abandon open innovation (2014 study vs 2018) because they consider it a long-lasting strategy. Secondly, as our typology analysis revealed, the majority of OI cases in our study are attributed to efficiency-driven OIs rather than externally-

recommended OIs, as identified by Gebauer et al. (2017). Thus, our findings suggest that the adoption of OI is driven by rational choices rather than by external suggestions.

Individual

The empirical findings suggest that the adoption of open innovation practices is driven by international experience and self-directed learning. International experience represents the rational perspective of MI and assumes that the adoption of managerial practices is driven by managers to improve their working routines. In the MI literature, our findings are in line with Kimberley and Evanisko (1981), who support the role of international experience in the adoption of new managerial practices. As for the open innovation literature, studies on micro-foundations are just starting to emerge (e.g., Ahn, 2020; Ahn et al., 2017; Bogers et al., 2018b; Rangus and Černe's 2017), and as such, our findings complement these studies in the following ways.

Firstly, our study offers important insights into a growing body of literature on OI micro-foundations and demonstrates that individuals who have international experience are more able to make a rational choice when it comes to the adoption of open innovation practices than those who do not. For example, when it comes to implementing university partnerships in Asia (inbound OI), a person with a solid regional knowledge will be more able to make a rational decision to avoid adoption failures than someone who has solely an American or European perspective (e.g., P4). According to Lavrynenko et al. (2018), in biotechnology sectors for OI professionals, what matters most is the knowledge of international standards and regulations. This knowledge can come from residing and working in different countries, i.e., international experience is significant. Secondly, our findings demonstrate that the participants from Hong Kong adopt open innovation practices more frequently than those who live in the UK. This is a timely contribution to the question raised by Bigliardi et al. (2020), who suggest analysing the impact of a global, mobile and diverse workforce on open innovation. In this matter, our findings highlight how individuals with international experiences are more likely to drive open innovation in cities, where the concentration of expatriates is higher than in other places.

As for self-directed learning as a micro foundational factor, our findings are consistent with those of the MI literature (e.g., Khosravi et al., 2019; Ho et al., 2011). Our findings suggest that individuals who are able to organise themselves for learning are more likely to drive the adoption rather than individuals who prefer guided learning. The significance of self-directed

learning could be linked to self-motivation, which is considered an essential factor to facilitate the implementation of OI (da Mota Pedrosa et al., 2013). In our sample, participants stated that self-directed learning not only impacts their decision-making when it comes to adoption but also motivates them to keep moving forward when they learn about success stories. This finding also has important implications for SHRM to support individuals' capabilities to drive open innovation (Engelsberger et al., 2021) and help to identify individuals who are self-learners. This means that organisations might need to introduce environments where employees have a certain level of autonomy, time and independence, which contributes to learning, as suggested by Burcharth et al. (2017).

Surprisingly, managerial tenure as a micro foundational factor was rejected by the majority of the participants. This finding contradicts the management innovation literature, which sees it as a factor impacting the adoption process (e.g., Khosravi et al., 2019; Damanpour and Schneider, 2006). This contradiction can be explained by the fact that the average age of the participants in our study is 37, with the oldest being 55 and the youngest 30, whereas according to Vanhaverbeke et al. (2017), the average tenure of an OI manager is 15 years. Thus, in our data sample, the majority of the participants are young professionals, some of whom are already owners of their own businesses. The majority of the participants in the data sample represent foreign-born employment as they do not work in the countries of their origin. Someone having an average managerial tenure of 15 years means that a person had to spend most of his life and career in the same place, which is quite challenging in the current globalised world and, in particular, in places like Hong Kong, which has a very high concentration of expatriates. A constant movement of young professionals globally as well as technological advancement means that the skills that were in demand a few years ago are no longer valid, and, as a result, we see a rise in new industries and new jobs, which suggests shorter tenures and job-hopping becoming a new normal (Bersin, 2017/ Deloitte Report). This finding can also be supported by a study that shows how CEO turnover promotes open innovation (Biscotti et al., 2018).

On the whole, these findings demonstrate how a globalised workforce changes the open innovation landscape, as was called for by Bigliardi et al. (2020).

6.3.1 NEW FACTORS

The empirical findings also revealed some new factors that impact on the adoption of open innovation practices as management innovation, according to the participants. These factors are the following:

1) *Reputation*, as an adoption factor, can be attributed to both the technological and environmental/institutional contexts of the TOEI-MI. On the one side, when selecting external partners, the adopting parties have to carefully consider the reputation of the external partners, i.e., technological/innovation characteristics; from the other side, organisations that try to establish themselves as trustworthy cannot be associated with bad actors, because this can damage their own reputation and subsequent performance. As a result, they have to conform to normative demands and expectations, i.e., the environmental and institutional context of the TOEI-MI. Thus, reputation can be considered a multilevel variable in our study. Based on the institutional theory, we can suggest that reputation is closely linked to the institutional perspective of MI (Birkinshaw et al. 2008), meaning that under specific professional and societal standards, organisations have to act responsibly when they seek to achieve legitimacy (e.g., DiMaggio and Powell, 1983; Newburry, 2012). From the open innovation perspective, our findings are in line with De Groote and Backmann (2020) and Geringer (1991), who consider the reputation of external partnerships as a factor in successful collaborations, and it builds trust in the open innovation collaborations (Hasche et al., 2017; Mubarak and Petraite,2020). The impact of reputation is especially evident nowadays, when empowerment movements and social media define how corporations or specific individuals should function. According to Hartmann et al. (2021), this type of behaviour is apparent in Western European cultures. This explains why this factor was brought up by many participants in our study. Although they do business in Asia, they still represent Western culture, work for Western companies, or have external partnerships in the West, and, as such, they need to find the right balance between external partnerships in East and West. For example, in section 5.4.1 of chapter 5 the issue of balancing between different cultures was brought up by P4 who is based in Asia, but maintains external collaborations in the USA and China. In line with this, a recent study by Engelsberger et al. (2021) suggests that since OI represents a potential growth in the APAC region, organisations that have HQs in the West will need to reconsider their strategies when it comes to managing the open innovation practices. Based on this, our findings provide a timely contribution to highlighting the importance of reputation for open innovation.

2) *Office layout* is an organisational factor that was identified during text-mining analysis and was then supported by the interview transcripts. Especially, based on the text-mining analysis, it was revealed that some participants emphasised the impact of such factors as hierarchical office culture, cubicle office layouts and the working from home environment.

Altogether this suggests that at the individual level, certain aspects of office design can facilitate the adoption of open innovation as a form of management practice and, especially, this will be an essential topic of discussion in a post-COVID-19 workspace. On this note, the literature suggests that employees who are exposed to the co-presence of their colleagues in an open layout are more likely to share knowledge and ideas between them than those who work in separate rooms (Appel-Meulenbroek, 2010). Al Horr et al. (2016) argue that different office layouts may have an impact on occupants' productivity. For example, less hierarchical office structures contribute to creative tasks, whereas for tasks that require a high level of concentration, a smaller space is favourable. It is interesting to note that Al Horr et al. (2016) discuss the role of national cultures in relation to office layouts. This point was brought up by participants who represent large and multinational organisation. For example, P14 discussed how in their case, the adoption rate is different as every local office has a different local culture. Thus, the results of our study offer new insights for open innovation scholars and practitioners by discussing how at from the individual perspective, a less hierarchical office layout may speed up the adoption of OI activities and have an impact on managerial practices. However, multinational organisations need to find a proper balance between local cultures and their organisational values. For instance, Al-Esia and Skok (2014) found that in Arab cultures the office layout represents the hierarchal local culture, where preference is given to personal connections and status. This presents a challenge for multinational organisations in post-COVID-19 times as more employees will prefer to work from home, and, as such, it could potentially slow down the adoption of open practices because there will be less knowledge sharing and exposure to colleagues. A digital transformation can be one of the ways to address this challenge and to promote a knowledge-sharing environment (Urbinati et al., 2020).

3) *Global Situation 2019/2020* is an environmental factor that was identified by the participants when it comes to the adoption of open innovation. In particular, participants emphasised the impact of the global pandemic (SARS-COV-2) on their decision to either engage with or disengage from open innovation practices. For instance, some of the participants in our data sample explained that they had to review the list of external collaborations since their working arrangements have been impacted, reducing the need for so many external agents and due to financial constraints, while others suggest that the global pandemic was the primary motivator to adopt open innovation practices and offer them in the form of services as their clientele's needs change. Although organisations typically have

management strategies in place for crisis situations and disruptive events (Meyer, 1982; Thorgren and Williams, 2020; Williams et al., 2017), the global pandemic has been identified by many as a "black swan" (e.g., Mishra et al., 2020; Thorgren and Williams, 2020), which means organisations have to demonstrate resilience and act fast as a response to a crisis. In the open innovation literature, it has been previously documented how organisations under crisis adopt open innovation, e.g., the case of Fiat (Di Minin et al., 2010). In our findings this pattern was observed in two ways. Firstly, as demonstrated in section 5.4.3 of chapter 5 some participants (C-suite and owners- P8-P10, P19) saw COVID19 as an opportunity to create an IP for out-licensing, i.e., opportunity-driven OI as MI. Secondly, those participants who represent SMEs and large organisations stated that in their cases they had to retrain their staff since some of their clients cut costs for external partnerships (e.g., P22). Thus, our results highlight how the adoption of open practices in some cases is seen as a survival strategy due to unprecedented circumstances and this adoption amends these same individuals' work routines as they need to jump on board quickly and learn new skills.

4) *Extrinsic and intrinsic motivation* is an individual context factor that was found to be significant during the data analysis for the adoption of open innovation practices as management innovations. The participants suggest that they engage in the adoption behaviour either because they feel altruistic and want to create a change or the adoption of these practices helps them to achieve their personal and organisational goals as discussed in section 5.4.4 of chapter 5. In management innovation literature, the role of extrinsic and or intrinsic motivation has not been studied, to the best of our knowledge. However, the identification of this factor empirically emphasises the rational perspective on management innovation, meaning that individuals drive the adoption to pursue their own goals to do the work more effectively (Birkinshaw et al., 2008; Damanpour and Aravind, 2012). As for open innovation, these results are in line with Chan et al. (2017), who analyse the role of the extrinsic and intrinsic motivation of team leaders in integrating the inbound OI activity. The remaining open innovation literature focuses on the role of intrinsic and extrinsic motivations only in studies about OSS and crowdsourcing, while the rest of the OI studies are primarily focused on the analysis of intrinsic and extrinsic motivations in attracting users (e.g., Battistella and Nonino, 2011; Hausberg and Spaeth, 2018; Mack and Landau, 2018). From this perspective, our study offers an answer to Bogers et al. (2017), who question what motivates R&D employees and open innovation managers to participate in OI related activities. Our study, however, expands this discussion by focusing on non R&D employees.

6.4 ANSWERING RESEARCH QUESTION 3: HOW DO THE ADOPTED OPEN INNOVATION PRACTICES AS MANAGEMENT INNOVATION IMPACT INDIVIDUALS' WELL-BEING?

Since the findings of this study confirm that the open innovation practices are management innovation, the third objective of this study was to analyse the individual level outcomes associated with the post-adoption impact of the open innovation practices, a topic that is largely overlooked in the open innovation literature. By fulfilling this objective, this study contributes to a growing body of literature on the "human side" of open innovation research (e.g., Ahn, 2020; Ahn et al., 2017; Badir et al., 2019; Bogers et al., 2018b) and provides insights into the personal level outcomes associated with the adoption of management innovation (Khosravi et al,. 2019).

Thus with regard to this objective, the findings of this study provide empirical evidence that the adoption of open innovation practices as management innovation positively impacts individuals' work engagement, work satisfaction and personal productivity. Since the management innovation literature does not offer any insights into the individual level outcomes associated with the adoption of MI, rather it focuses on organisational level outcomes (e.g., Volberda et al., 2013; Volberda et al., 2014; Nieves, 2016), let us examine where our results stand in the open innovation literature.

Within the open innovation literature, the results of this study are consistent with a study by Lee et al. (2014), who state that a high level of open innovation climate is related to the higher degree of job satisfaction among employees at an organisational level. Additionally, a recent study by Badir et al. (2019) demonstrates how the employees' use of external knowledge sources (inbound) positively impacts their innovative work output. Similarly, a study by Salter et al. (2015) suggests a curvilinear relationship between an individual level openness towards external sources (inbound OI) and ideation in R&D. Our study does not focus on the innovative work output as is the case with the study by Badir et al. (2019). It investigates the personal productivity, which in turn is measured on a number of new innovative ideas produced as a result of adoption, i.e., direct impact rather than curvilinear. Taking into account the results of these three studies, our study, however, presents the individual perspective, unlike the first study, and includes the outbound open innovation practices, unlike the second study, and as such, it moves the discussion forward. As for work engagement, the open innovation literature does not provide many insights about a direct

impact; instead, it focuses on the mediating role of work engagement and the quality of the open innovation process (Edelbroek et al., 2019).

Whilst we are able to compare our results with some of the open innovation research, on a broad scale, there are not many insights into the individual level outcomes, because, traditionally, scholars suggested that individuals who engage in open innovation activities might demonstrate decreased levels of work-related dimensions and negative attitudes due to tensions between the NIH and NSH syndromes (e.g., Antons and Piller, 2015; Burcharth et al., 2014). From this perspective, our study contradicts this prevailing notion among OI scholars for the following reasons. Firstly, this study does not focus on R&D employees and their activities; instead, it focuses on a diverse group of people such as CEOs, co-founders, directors etc. Secondly, in this study, we consider open innovation practices as management innovation, which means that individual-level outcomes are assessed from a managerial perspective rather than purely from the perspective of value creation. Evidently, individuals who adopt outsourcing or beta-testing do so to enhance their work efficiency, i.e., they would not adopt it otherwise. True, some participants stated that the implementation of these practices is associated with such challenges as working in different time zones and through language barriers (outsourcing), spending time setting up things and others, yet our findings suggest that the adoption of these practices overall improves their job routines once it becomes a norm as it saves time and helps to focus on what is more important.

Another critical insight that is associated with the adoption of open innovation practices as management innovation is related to changes in career trajectory. This is in line with management innovation scholars (e.g., Birkinshaw et al., 2008; Hamel 2006; Vaccaro et al. 2012), who suggest that any managerial practice adopted should lead to changes in managerial processes, practices, structures and techniques and answers the call made by Bogers et al. (2017), who question how individual identities are transformed under the impact of open innovation. For example, a number of participants in our study state the adoption of open innovation changes their job responsibilities and provides them with personal growth. These two topics were brought up by P1-P3, P5-P7, P9-P14, P16-P18, and P20-P22, as demonstrated in section 5.5.1 of chapter 5. Especially, P17, P18, P21 and P22 explained how the transition to the open innovation role facilitated the acquisition of new skills as they had to move from their old roles to new ones. From this perspective, the adoption of OI practices demonstrates changes in management processes which is a shift from a traditional managerial job, and changes in managerial structures in a way how responsibilities are allocated as

suggested by Birkinshaw et al. (2008) and Vaccaro et al. (2012). Here, it would be helpful to bring in an example of self-managed work teams as another form of management innovation when comparing the open innovation to other management innovation practices. Similarly to open innovation, the introduction of self-managed teams was found to increase general team productivity (Bunderson and Boumgarden, 2010; Castiglione, 2007) and workplace satisfaction (Castiglione, 2007).

These new findings are somehow consistent with a longitudinal study by Lifshitz-Assaf (2018), who observed how R&D professionals went through a professional identity transformation after the introduction of crowdsourcing as OI at NASA. While the findings by Lifshitz-Assaf (2018) suggest that the adoption of open innovation changes individuals from being a problem solver to a solution seeker, the empirical results of our study demonstrate how the adoption of the open innovation practices allows individuals to grow professionally by adding to their skillsets. Similarly, our findings extend the study by Alexy et al. (2013) and Salter et al. (2014) in such a way that we are able to demonstrate how individual roles change under open innovation. The acquisition of new skills, as indicated by our participants, also supports recent findings by Lavrynenko et al. (2018), who state that although the organisations (biotechnology) are mainly focused on hard skills, there has been an increased demand for soft skills when it comes to open innovation professionals. Indeed the results of our study are able to confirm this as our participants discussed increased communication, managing external partnerships, among other acquired soft skills since engaging in open innovation (e.g., P17, P18, and P22). Obviously, technical knowledge matters, but it comes from experience and education, whereas soft skills can only be acquired during the process of engaging in OI practices. From this angle, our study contributes to the notion of the competencies required for open innovation. For instance, while the majority of research focuses on the educational and work background (e.g., Ahn 2020; Ahn et al., 2017; Bogers et al., 2018b), our study highlights the importance of soft skills that are acquired from participating in OI activities, and these skills are essential criteria for those open innovation professionals who are engaged in building external relationships with partners.

Thus, the third research question of this study can be answered in the following way. *The adoption of the open innovation practices as management innovation changes the managerial practices as some of the OI practices become a norm, and it creates changes in the managerial structures by allowing individuals to acquire new skills and to grow professionally.* This means that organisations or top managers that adopt open innovation

should be aware not only of its technological outcomes but also pay attention to the managerial implications that are inevitable. One of the ways to prepare for these changes can be the creation of individual roles and relevant organisational structures that can support the transition of employees from one role to another as suggested by Zynga et al. (2018).

6.5 SUMMARY

To sum up, this chapter has provided a critical discussion on the findings obtained in chapter 5 of this thesis. Our findings throughout the discussion suggest that the open innovation practices can be viewed as management innovation based on the similar characteristics of both. The adoption of these practices happens under the impact of their technological characteristics within the cultural, institutional and rational perspectives of MI. In particular, specific government and non-government regulations can impede the diffusion process, and the globalisation of the world is changing the profile of open innovation professionals. Our discussion demonstrated that open innovation is not a management fashion and can be applied as a long-term sustainable practice. This chapter also discussed how the adoption of open innovation practices not only positively impacts individuals' well-being but also contributes to their personal growth. The next chapter will present the conclusion, along with contributions made and a discussion of the limitations.

CHAPTER 7. CONCLUSION

Chapter 7 is the final chapter and its purpose it to provide a summary of this study. Thus, it firstly revisits the objectives of this study along with the research methods used to reach them. Secondly, it outlines contributions both to theory and practice. Lastly, it discusses the limitations and the possible avenues for future research.

7.1 SUMMARY

This study was focused on exploring the adoption of open innovation as a form of management innovation and its post adoption impact on individuals. The TOEI-MI framework was applied to explore factors that impact the adoption of open innovation practices in a systematic manner at the individual-level. Thus, the following research objectives were set:

1) To establish the research link between the concepts of open innovation and management innovation and to understand to what extent the open innovation practices can be considered and applied as a form of managerial practice.

2) To present a systematic understanding of what factors impact on the adoption of open innovation practices as a form of management innovation at the individual-level of analysis.

3) To analyse the individual level outcomes associated with the post-adoption impact of the open innovation practices as a form of management innovation.

In order to meet these objectives this study applied qualitative research methods. In particular, semi-structured interviews were selected as the primary data collection method. In total, 22 interviews were conducted with participants that represent different industries and regions. A further text-mining analysis was carried out to supplement the data obtained from the interviews. Our findings demonstrated that the adoption of open innovation as management innovation can be influenced by different contexts or a combination of a few contexts and that the adoption has a significant impact on individuals that engage in open innovation. The findings of this study can be used by both open innovation and management

innovation scholars and practitioners representing both research domains. Table 7.1 provides a summary of how the findings of this study met the research objectives and answered the research questions set.

Table 7.1 Summary of the findings

Research objectives	Research questions	Our findings
1) To establish the research link between the concepts of open innovation and management innovation and to understand to what extent the open innovation practices can be considered and applied as a form of managerial practice.	1) What is the conceptual relation between the open innovation paradigm and management innovation?	The adoption of OI is MI based on the characteristics it shares, changes it produces and based on the similarities of typologies shared between OI and MI.
2) To present a systematic understanding of what factors impact the adoption of the open innovation practices as a form of management innovation at the individual-level of analysis.	2) What factors impact the adoption of open innovation practices as a form of management innovation at the individual level of analysis?	- Found evidence for 11 factors out of 15 that represent the individual perspective; - Identified four new factors- reputation, office layout, COVID-19, extrinsic and intrinsic motivations;
3) To analyse the individual level outcomes associated with the post-adoption impact of the open innovation practices as a form of management innovation.	3) How do the adopted open innovation practices as management innovation impact individuals' well-being and transform their jobs?	- Identified that OI as MI impacts work engagement, work satisfaction and personal productivity; - Identified that OI professionals acquire new skills and transform to new roles, i.e., changes in organisational structures;

A brief discussion on each of the research objectives will be provided below.

7.1.1 REVISITING THE RESEARCH OBJECTIVE 1

To establish the research link between the concepts of open innovation and management innovation and to understand to what extent the open innovation practices can be considered and applied as a form of managerial practice.

In chapter 2 of this study it was proposed that open innovation practices, namely inbound and outbound, share the same characteristics of management innovation as per Birkinshaw et al., (2005), Mol and Birkinshaw (2008), Mol and Birkinshaw (2009). Thus, based on the conceptual comparison between the two domains, this study viewed open innovation as

management innovation. The empirical findings revealed that open innovation is a form of managerial practice based on the following. Firstly, our results suggested that the application of and participation in open innovation related activities share three out of four characteristics of management innovation- *exhibition of novelty, alteration of management work,* and *intention to further organisational goals*. The only characteristic we could not directly observe is *implementation,* as we believe a longitudinal study will be needed to establish that. Secondly, the findings also demonstrated that the operational definition of management innovation as per Birkinshaw et al. (2008) can be similarly applied to open innovation based on such attributes as: a) *what is being innovated?*; b) *how new is the innovation?*; c) *what is the purpose of the innovation*?. Thirdly, qualitative data analysis found that the open innovation cases used in our study have the same typology as management innovation, as suggested by Gebauer et al. (2017). In our study based on the interview data four types of open innovation as management innovation were derived. These are: *externally-recommended OI as MI, efficiency-driven OI as MI,* o*pportunity-oriented OI as MI* and a *mixed type of efficiency-driven* and *opportunity-oriented OI as MI*. These findings are in line with the typology of MI proposed by Gebauer et al. (2017). Thus, with regard to the first objective this study can confirm that the application of and participation in open innovation activities is management innovation based on the characteristics it shares with MI, changes it produces and based on the similarities of typologies shared between OI and MI.

7.1.2 REVISITING THE RESEARCH OBJECTIVE 2

To present a systematic understanding of what factors impact on the adoption of open innovation practices as a form of management innovation at the individual-level of analysis.

In order to meet the second objective of this study, we applied the TOE (Technology-Organisation-Environment) framework to investigate the adoption of the open innovation as a form of management innovation. To extend the TOE framework and make it more relevant to the context of this study, we included the *individual context* in the original TOE framework and added four management innovation perspectives- *institutional, fashion, cultural and rational*. Thus, we extended TOE to TOEI-MI. The application of the TOEI-MI framework allowed us to examine the adoption of open innovation practices as a form of management innovation in a systematic manner and to explore new factors. The results obtained supported 11 factors out of the original 15 factors proposed. Among the main factors that were found to be significant by the participants are*: technological characteristics* of the open innovation practices, namely relative advantage, compatibility, complexity and triallability;

organisational factors such as size, top management support and culture, which also confirmed the cultural perspective of management innovation; *environmental factors* such as coercive and normative pressures, which is in line with the institutional perspective of management innovation; *individual factors*, namely international experience and self-directed learning, which also supported the rational perspective of management innovation. In addition to this, we were able to discover a number of new factors that impact on the adoption process. These factors are: *reputation of external partnerships,* which acts as a factor in both the technological and environmental contexts; *office layout* as a factor within the organisational context; *COVID-19* as a factor within the environmental context; *extrinsic and intrinsic motivations* of the participants, representing the individual context. On the other hand, such factors as industry, fashion setters, mimetic pressure and managerial tenure were not found to be significant for the adoption.

7.1.3 REVISITING THE RESEARCH OBJECTIVE 3

To analyse the individual level outcomes associated with the post-adoption impact of open innovation practices as a form of management innovation.

In order to meet the third objective, participants were asked to describe how the adoption of open innovation impacted on their work routine across three dimensions, namely *work engagement, work satisfaction* and *personal productivity*. All three dimensions were found to be positively impacted as a result of open innovation adoption. Although some participants argued that such open innovation practices as outsourcing and contracting can be quite challenging due to regional and language differences, the long term benefit outweighs some of these challenges. The main benefits that come with the adoption of open innovation practices are: less time spent on repetitive work, improved consistency of job routines, ability to be heard through open feedback, becoming a part of a community and others. The most important outcome of the adoption is, however, the fact that individuals that participate in open innovation are able to grow professionally and acquire new skills. As a result, after some time they find themselves transitioning to new roles. This finding supports the earlier established notion that the adoption of open innovation is a form of managerial practice, as it brings changes in organisational structures.

7.2 THEORETICAL CONTRIBUTIONS

This study offers several significant theoretical contributions to both MI and OI domains. Firstly, this study's most important contribution is the integrated view of the two research

areas of innovation, open innovation and management innovation. This is a particularly valuable contribution for strategic management scholars since the open innovation paradigm has become an absolute imperative in the domain (Bogers et al., 2019). From this perspective, our study is one of the first to offer such an original and unique research perspective, which allowed us to move from a traditional technological or innovation/financial performance focus on open innovation research and examine it from the managerial perspective. On this note, Bogers et al. (2019) suggest that future research in the open innovation domain should shift beyond regarding open innovation as the research outsourcing activity but focus on how open innovation can strengthen internal capabilities and what are the limits and benefits of the paradigm. Thus, our findings demonstrated that internal managerial practices would be impacted when organisations shift to open models, and as such, it highlights the importance of considering the managerial aspects of open innovation rather than focusing on its strategic outcomes only- an insight that can provide a better understanding of how to manage open innovation. Altogether, our findings provide a timely contribution to the recent research call by Simao et al. (2020), who suggest expanding the management innovation domain towards open innovation and investigate the role of organisational openness.

Secondly, previous research that integrated OI and MI in one context did not differentiate between the two modes of open innovation and investigated the two concepts separately. For example, studies by Damanpour et al. (2018) and by Mol and Birkinshaw (2014) only focus on analysing the role of external sources on the creation of management innovations, whereas in our study we demonstrated how managerial practices are transformed under the impact of both inbound and outbound OI. This is a very important contribution to general OI research, as the majority of it is focused on analysing the inbound mode and as a result there is little understanding on outbound practices (Gao et al., 2020; Lichtenthaler, 2015; West and Bogers, 2017). Not only has our study implemented two modes of OI, but it has also demonstrated that these two types of OI emerge under different conditions. In particular, our study suggested that the adoption of outbound open innovation practices is an opportunity-oriented management innovation that normally happens in small companies or start-ups, whereas the adoption of inbound open innovation practices is an efficiency-driven management innovation and is normally applied to address the existing challenges in large organisations. From this perspective, our findings contribute to the contingency perspective on open innovation research as identified by (Huizingh, 2011; Gassmann, 2006) by exploring the effectiveness of different open innovation cases depending on the context.

Thirdly, the application of the TOE framework allowed us to examine the adoption of OI as MI in a systematic manner by focusing on the individuals and their experiences. To the best of our knowledge there are no such existing empirical frameworks in open innovation research, as the antecedents that contribute to its adoption are poorly studied (e.g., Hussain Bhatti et al., 2021). Similarly, management innovation research suffers from the lack of a systematic understanding on how factors from different contexts interact with each other and impact on the adoption (e.g., Khosravi et al., 2019). The only two studies that we are aware of concerning these research domains are the one by Schroll and Mild (2012), which conceptually categories the contexts that may impact on the adoption of OI, and another conceptual paper by Damanpour and Aravind (2012), which investigated the antecedents of MI. The results of our study do not only extend the previous conceptual knowledge, but also provide essential empirical knowledge on how the adoption of OI as MI takes places. The application of the existing TOE knowledge has made it possible to explore how factors from various contexts interact with each other and impact on the adoption of OI as MI and to explore new factors. For example, our study revealed that reputation is a multilevel factor that represents both the technological and environmental contexts. From this angle, our study provides a timely contribution to a research call by Bogers et al. (2017), who argue for more studies concerning the multi-level nature of OI. In addition, our findings also contribute to a better understanding of the multilevel nature of management innovation as suggested by Volberda et al. (2014) by demonstrating how change agents (individuals in our case/rational perspective) navigate external environments (institutional perspective) to drive adoption.

The subsequent sections will be focused on the theoretical contributions made to OI and MI domains separately.

7.2.1 CONTRIBUTIONS TO THE OI RESEARCH

With regard to the open innovation research domain, the theoretical contributions of our study are the following. Firstly, the results of our study have contributed to an emerging line of inquiry on the "human side" of open innovation research, in line with Ahn (2020), Ahn et al. (2017), Bogers et al. (2018b), Badir et al. (2019) etc. By integrating the MI perspective, this study was able to confirm the impact of new micro foundational factors on the adoption of OI at the individual-level, namely cosmopolitanism/international experience and self-directed learning. To the best of our knowledge, neither of these factors or their effects were previously examined in OI literature. For example, a study by Ahn (2020) focuses on such individual characteristics CEO education, CEO network, CEO attitude, whereas a study by

Bogers et al. (2018b) analyses such personal characteristics as diverse network and diverse educational backgrounds. From this perspective, our finding offers valuable insights for scholars because it gives a better understanding of the individual level factors and the adoption of OI and, as such, addresses an important research gap in open innovation research, as per Bogers et al. (2017) and others. In particular, the results of our study suggest that professionals with international experience are more likely to drive the adoption of OI. This newly identified employee level characteristic adds novel insights to the competence profile that are required for OI professionals (e.g., Ahn, 2020; Bogers et al., 2018b; Chatenier et al., 2010) and highlights the importance of diverse backgrounds (Vanhaverbeke et al., 2017). Altogether, we hope this micro-level perspective will help explain why some individuals are better than others at adopting and coping with OI (Salter et al., 2014).

The second most important contribution of this study to the field of open innovation is the examination of the individual level outcomes associated with the adoption of OI activities rather than the organisational ones. As chapter 2 of this thesis demonstrated, our understanding of organisational level outcomes (e.g., Hung and Chou, 2013; Moretti and Biancardi, 2020) exceeds those of individual outcomes. The results of our study were able to demonstrate that individuals that participate in the open innovation processes feel more engaged, productive and satisfied with themselves. This offers important insights into open innovation as prior research only focused on analysing the challenges associated with OI at the individual-level (e.g., Lifshitz-Assaf 2018; Salter et al., 2014). While our study has documented the challenges associated with different time zones and language barriers for outsourcing/ contracting, it has also been able to identify the positive aspects of OI adoption. For example, the results of our study suggested that the participants feel more engaged with their work as the adoption of OI helps them to deliver value for their companies. On this note, Lizano (2021) states that workers who feel more engaged in their work are more satisfied with their lives and have better health. According to Health and Safety Executive annual statistics [3] (2020), 828,000 employees of all ages and sectors in the UK suffer from work-related stress, anxiety and depression, which results in 17.9 million of lost working days. Among the factors that contribute to work-related stress one is associated with role uncertainty and another one with too much workload, as identified by HSE (2020). From this perspective, the results of our study confirmed that the adoption of certain open innovation

[3] The statistics provided by Health and Safety Executive (HSE) is based on the data obtained from the Labour Force Survey in 2019/2020.

practices reduces workload (e.g., outsourcing, beta-testing) and contributes to better identification of job responsibilities as the participants were able to allocate free time for strategic executions instead of doing repetitive tasks. Thus, our study demonstrated that open innovation could be considered a workplace experience that facilitates employees' well-being. To the best of our knowledge, no prior research has analysed open innovation from the perspective of workplace well-being. Additionally, these results are critical for those scholars who want to study the application of OI practices beyond R&D (unlike studies by Lifshitz-Assaf 2018; Salter et al., 2014) because our findings suggest that innovation no longer takes place in R&D rather, it affects all the employees involved (Badir et al., 2019). As a result, the impact of adoption may vary among professionals at different levels, which the results of our study confirm.

Thirdly, our study has demonstrated how individuals that are engaged in OI activities go through career change as they acquire new skill sets and are exposed to new responsibilities. This finding provides an important contribution to understanding how individuals benefit from participating in OI activities. In a recent paper, Laursen and Salter (2020) question how employees that participate in inbound OI activities gain value for themselves. Similarly, the results of our study suggest that some individuals are purposively switching to OI activities as this provides them with more soft skills in the form of networking, connections and others. While Laursen and Salter (2020) discuss the implications for financial values, e.g., wages, bargaining power, our study sheds light on the implications for employees and how participation in open innovation activities contributes towards their human capital and development of their soft skills. Moreover, this finding offers a crucial understanding of how the application of open innovation may lower employee turnover intentions. Our findings revealed that engagement in open innovation activities gives employees an opportunity to learn and progress in their career. According to Weng et al. (2010), employees that are able to professionally grow and develop within their organisations demonstrate stronger organisational attachment, which in turn contributes to improved employee retention (Naqvi and Bashir, 2015). Thus, from this perspective, our study provides valuable contributions not only to the open innovation literature, but also to organisational scholars by highlighting the behavioural aspects of participating in OI activities. To the best of our knowledge, these aspects of participating in OI activities have not been discussed by prior research. In other words, our results suggest that participation in OI activities for non R&D professionals is seen as an opportunity to grow rather than a challenge. This once again demonstrates the

importance to consider the managerial perspective when a firm decides to open up for innovation.

7.2.2 CONTRIBUTIONS TO THE MI RESEARCH

The results of our study contribute to MI research in the following ways. Firstly, MI research is one of the most understudied elements in innovation literature, and as a result, many of its areas remain largely unexplored. In general, our study advances the field of management innovation by investigating its antecedents and by providing an integrated conceptualisation as suggested by Damanpour (2014). Moreover, our study answered a call by Khosravi et al. (2019) by providing a systematic adoption framework that not only identifies and empirically tests the drivers of MI adoption but also clears up confusion on such factors as size. In particular, we explored a full set of technological/innovation characteristics of MI and their impact on adoption, as called for by Khosravi et al. (2019) and Simao et al. (2020), as well as identified a new technological/innovation characteristic- *reputation*. This finding highlights the importance of the innovation characteristics of MI and can serve as a starting point for future research.

Secondly, through an application of the TOEI framework and the open innovation perspective this study has revealed a number of new factors that can be included in future MI research and which have not been studied previously. For example, the role of the intrinsic and extrinsic motivations of individuals that participate in driving MI as well as the reputation of external actors. The role of extrinsic and intrinsic motivation contributes to our understanding of the nature of MI micro foundations and fulfils a line of inquiry as per Volberda et al. (2014) and Volberda et al. (2013), who called for more research on MI micro foundations and, in particular, what drives key individuals to adopt MI. Furthermore, the text-mining analysis allowed us to identify office layout as an organisational level factor that facilitates the adoption. This factor itself can be considered as reinventing management practices as through less hierarchical layouts organisations are able to achieve better productivity (Birkinshaw and Mol, 2006).

Finally, considering the growing academic interest in the field of MI, as highlighted by Khosravi et al. (2019) and Simao et al. (2020), this study provides a timely contribution and identified a number of factors that have not been analysed recently with regard to MI adoption. For example, the role of self-directed learning was analysed by Ho (2011) almost ten years ago, whereas the role of fashion-setters has not been revisited in decades, as an article by Birkinshaw et al. (2008) implies. Not only has our study identified a number of

factors, but it also provided a fresh perspective on new managerial practices in the form of open innovation. This is an essential contribution to MI literature as according to Mol and Hamel (2014) the majority of MI research is limited to traditional practices. By offering this kind of creative perspective, our study opens up possibilities for more innovation practices to be studied as management innovation, which in turn could impact on current research practices as suggested by Birkinshaw et al. (2008).

7.3 PRACTICAL CONTRIBUTIONS

The results of our study offer significant contributions to practitioners in the following ways. First and foremost, our results contribute to a better understanding of what types of individuals can drive the adoption of open innovation practices. This is a particularly valuable insight for hiring managers, as our results identify the role of international experience as one of the factors to look at. On this note, Ahn et al. (2017) state that for a successful implementation of open innovation, CEOs and top managers need to recruit complementary individuals whose characteristics are different from theirs as it is impossible for one individual to possess all the necessary skills. Our study shows that those individuals who have international working experience are more likely to the OI practices than those who have predominantly lived and worked in their countries of origin. The report produced by Vanhaverbeke et al. (2017) on the profile of open innovation managers emphasises the role of managerial tenure, whereas the results of our study suggest the opposite. Reliance on professionals who have longer tenure may impede the implementation of OI practices. Thus, we suggest hiring managers pay more attention to individuals who have lived and worked abroad and can demonstrate cultural competence. This is an important individual-level asset for organisations that are looking to expand globally, as it contributes to a better understanding of cultural nuances and important market knowledge that others may not have.

Secondly, and in addition to the first contribution, our study has demonstrated that the adoption of OI as MI is not only limited to R&D professionals, but to all the individuals involved. In particular, our study suggested that those individuals who feel extrinsically motivated are more likely to drive the adoption. As the results of our study suggested, this extrinsic motivation does not always come from financial rewards, but it mostly comes if an individual feels that the processes they are involved in are contributing to organisational goals. This insight offers practical guidance to managers, who need to align the strategic goals of their subordinates. We suggest that managers create performance management

programs for OI activities and engage their subordinates more often in OI activities. This will contribute towards a better dissemination of these practices among employees, which in turn will increase the general innovativeness of the organisation. This recommendation is consistent with that of Badir et al. (2019), who stress the importance of employee-level innovative behaviour that happens beyond R&D and is considered as a source of customer value (Frank et al., 2014).

Thirdly, our findings provide important insights for owners of small organisations and start-ups. In particular, our results demonstrate that the adoption of OI practices happens unevenly under the impact of government and non-government regulations, e.g., GDPR. This is an especially important factor for those professionals who represent MarkTech and PropTech start-ups, as our data sample suggested. In fact, a study by Martin et al. (2019) states that GDPR will impede the development of data-driven businesses in the EU. Our results demonstrate that unlike the EU, Hong Kong and Singapore present more flexible conditions when it comes to these sorts of regulation. From this perspective, our finding contributes to explaining how management concepts can be moved across borders from the individual perspective under the impact of the external environment as called for by Ansari et al. (2014) and Volberda et al. (2014). This finding could potentially help owners that are seeking to expand the scope of their business, since these regions promote more favourable conditions and there is less bureaucracy involved at the moment, which in turn creates a good climate for start-ups. This is also an important finding for owners who are currently based in the APAC region (Hong Kong and Singapore in the case of this study); before looking to expand their operations in Europe and the USA, it is recommended they consult with local regulators and are prepared for the adoption to be slowed down due to local laws. It is also important to note that open innovation practices in general are not limited to the ones we have presented in this study. Such concepts of OI as open banking, open governance, open finance will be directly affected by these regulations, and as such, our findings offer practical advice to professionals that represent these industries, and to policy makers that want to create favourable conditions for new businesses.

Finally, our findings provide useful contributions to those practitioners who are engaged in the application of technological forms of innovation (e.g., technology or product). By focusing on individuals as the unit of analysis, our findings are able to demonstrate how the application of and participation in the open innovation activities improves employees' work related performance and enhances their happiness at work. This consideration can be also

applied in the context of technological and product innovation since some of the OI practices include technological aspects (e.g., OSS, crowdsourcing etc.). Put simply, by improving individuals' work-related performance, identifying their goals, helping them to achieve these goals etc. individuals should also demonstrate improved performance when it comes to the application of technological innovation, which in turn can improve an adoption rate of new technologies. In addition to that, our findings present practical contributions to the field of learning organisation by exploring how self-directed learning facilitates the bottom-up adoption of OI. Since one of the main barriers to learning organisations is resistance to change, our study identifies that non R&D employees who are motivated to self-learn are more likely to adopt and participate in the open innovation activities, which in turn increases knowledge sharing among employees that leads to learning organisation. Essentially, OI is about collaborations and knowledge sharing, so we hope that the results of our study will help managers and organisations to adjust one of the factors we explored in this study (e.g., office layout, open culture and TMS etc.) to accommodate for the adoption of OI. Altogether, we believe that this will improve general innovativeness of organisations starting from individuals, teams, departments and finally organisation as a whole.

7.4 LIMITATIONS

This study has explored an important research link between two streams of innovation research, namely the open innovation paradigm as per Chesbrough (2003a) and the concept of management innovation as per Birkinshaw et al. (2008). Although this study has reached its objectives and answered the research questions set, it is not without limitations. Four possible limitations of this study are discussed below.

The first and the most obvious limitation of this research lies in its research strategy. This study is qualitative and explorative by nature. The purpose of this research was to explore the phenomenon under investigation rather to describe or explain relationships between variables. As such, this research, like other qualitative studies, lacks statistical generalisation. In other words, the research framework used for this study does not statistically test the relationships between proposed variables. Rather it explores them through an application of semi-structured interviews. Thus, the results obtained need further quantitative testing. For example, in the research model used, as outlined in chapter 3 of this study, some factors had already been quantitatively examined in open innovation research, e.g., size or industry, whereas others had not, e.g., self-directed learning.

The second limitation of this study is time constraints. Due to the nature of any PhD research, a researcher has to meet certain deadlines to submit their project. The diffusion of innovations is a long and complex process. Based on this point, this study was not able to investigate how the participants search for the open innovation practices, how they apply them and how this process impacts them over an extended period of time. Rather it analyses the adoption of open innovation practices and their impact at the moment of data collection. From this perspective, a longitudinal study may shed light on the *implementation* of management innovation, one of the four characteristics of management innovation that this study could not compare against due to time limitations as discussed in chapter 6 of this study. Additionally, the application of a longitudinal approach may help explore new adoption factors and individuals might have different post adoption experiences after a while.

The third limitation of this study is conceptual. This study only focuses on the two original types of open innovation activity, inbound and outbound, and does not take into account the coupled open innovation activity as identified by Gassmann and Enkel (2004). Similarly, this study defines open innovation activities in the form of certain inbound and outbound practices as outlined in chapters 4 and 5 of this study and as applied by other scholars (similar to Damanpour et al., 2018). However, openness can be defined in the form of pecuniary and non-pecuniary approaches (Dahlander and Gann, 2010), and the open innovation activities can be measured by breadth and depth (Laursen and Salter, 2006). On the other hand, open innovation research is constantly evolving, and as such, new open innovation practices could be identified and studied in the near future. As for management innovation, this area still remains largely understudied (yet new studies have started to emerge) both contextually and methodologically, and as such, our research framework was limited to a number of adoption factors that have been previously studied in the MI literature.

The fourth limitation of this study lies in its sampling strategy across two dimensions, demographic characteristics and structural diversity. Although this study was not focused on participants from a particular region rather it aimed to target participants globally, the majority of its participants come from Western culture, had a Western education or represent a Western organisation. By targeting these types of participant, this study limited itself to a predominantly Western perspective; although analysing the APAC region is still rare in the open innovation research. This limitation arises from my personal experiences. Having studied and worked mainly in Western culture, my personal connections are limited to professionals who share the same background as I do. As such, this study did not target

Mainland China or professionals who work for Chinese companies, since there is no personal connection in that region. There is also a language barrier. However, it would be interesting to see how the results of studies conducted in such regions as Mainland China compare against the results of this study. With regard to structural diversity, our study focused on 'key informants', and in particular on professionals who hold high positions in their organisations from the C-suite to directors. Thus, this study excluded any professionals who work at lower-level positions such as analysts, supervisors, first-line managers and others. While the top-level managers execute the strategy, the lower-level managers are the ones who deal with it on a daily basis. As such, their experience and perspectives may be different from the top-level.

7.5 FUTURE RESEARCH

Based on the results obtained and the limitations identified, we propose the following research directions. Firstly, with regard to the limitations identified, future research could explore the adoption of coupled open innovation as managerial innovation and how the participation in these practices impacts on employees. Organisations that participate in coupled open innovation join alliances, innovation ecosystems and strategic networks. However, coupled open innovation is a more complex process than inbound or outbound OI as organisations need to find a balance between giving and taking. Evidently, this raises a question about how coupled open innovation impacts on managing individuals and transforms their experiences, as they become a part of a larger community and have to interact with external parties for a longer time, unlike inbound or outbound OI (Gassmann and Enkel, 2004). It is particularly interesting to explore how individuals that are exposed to coupled open innovation activities go through responsibilities transformation, as they need to use joint knowledge with their partners to create innovations (Enkel et al., 2009), what skills they acquire as a result of it and where they find themselves after a while.

Secondly, we suggest that future research focus on how the OI practices as MI are adopted in different cultures and economies. In particular, we think that a comparative study between developed and developing countries as well as between Western and Asian regions will help to shed more light on how societal norms and government policies impact on the diffusion of open innovation and managerial practices. Developing countries, particularly in Asia, e.g., Kazakhstan in our data sample, have different management styles in that societies are homogeneous, more hierarchical, more traditional, which means higher dependency on

professional and societal norms, i.e., normative pressure. For example, an interesting research area can be how Asian countries that are geographically based within the Belt and Road Initiative adopt new managerial practices and open up to cooperating with their western partners. In fact, such studies have already started to emerge, e.g., Brem and Nylund (2021). We expect that open innovation and managerial practices in these regions will not be applied in the same ways as happens in North American or European societies, as individuals will demonstrate a more closed and traditional behaviour. Potential questions to answer concerning this area of research: Do local organisations imitate the behaviour of western partners? To what extent do the local organisations and individuals absorb the external knowledge provided by the western partners? How do the local organisations and management prepare their employees for such external collaborations from the management perspective? Answering these research questions will help to shed light on how the OI and MI practices emerge in the context of regions (Bogers et al., 2017; Chesbrough and Bogers, 2014) and national cultures.

The third research direction is related to office layout as a factor that impacts on the adoption of OI practices. This factor was found to be significant during the text mining analysis and was supplemented by the observations made by the participants. This is a particularly interesting research area when it comes to post-Covid-19 workspaces. As more individuals feel more comfortable working from home, the nature of managerial practices will go through transition. From the one side, managers now need to think about how to promote knowledge sharing and creation among employees who work remotely. From the other side, organisations will need to come up with new managerial policies that can support the nature of open collaborations. A study by de Lucas Ancillo et al. (2020) suggests that post-Covid-19 workspaces will have to be more digital, less hierarchical and more agile. The results of our study demonstrated that many organisations and managers still prefer traditional managing routines, which is seen as a barrier to the adoption of open practices. It will be interesting to investigate how traditional and closed office cultures will go through such a transformation and whether the adoption of open practices will increase as a result of having less hierarchical structures and decreased communication barriers between the top and bottom level. Will employee level innovation increase, as employees feel more open and connected to share their knowledge? Future research should consider a comparative study between professionals with longer tenure as per Vanhaverbeke et al. (2017) and more junior staff to investigate how under current transitioning workspaces their adoption rates vary.

The fourth research direction comes from my personal experience working in digital marketing. In our data sample a significant number of the participants represented the marketing and advertising industry- this also includes MarkTech. Open innovation activities in this industry come in the form of external supplier integration, vendors, third-party intermediaries, using external agencies to outsource creative work and others. The post-Covid-19 transformation will majorly impact on professionals who represent this industry, as building relationships with their external partners offline (social activities, media events and so forth) is a big part of client management. Our results have indicated that some marketing professionals are already going through such a transition. For example, instead of outsourcing creative work to marketing agencies, clients now want to take these practices in-house due to the impact of Covid-19, so marketing professionals will now need to become consultants, which also creates changes in management practices. A further investigation on how professionals who are actively involved in external partnership acquisitions will help to understand how these types of industries will go through change and how this will impact on professional roles.

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APPENDIX A: ETHICAL INFORMATION SHEET

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

INFORMATION SHEET

An Empirical Investigation of Factors that Impact the Adoption of Open Innovation Practices as Management Innovation

You are invited to participate in the above project conducted by Narmina Rahimli, who is a post-graduate student of the Department of Industrial and Systems Engineering in The Hong Kong Polytechnic University. The project has been approved by the Human Subjects Ethics Sub-committee (HSESC) (or its Delegate) of The Hong Kong Polytechnic University (HSESC Reference Number: XXX).

The aims/objectives of this project are to understand what factors facilitate or hinder adoption of Open Innovation practices (OI) as Management Innovation (MI) from an individual/managerial level perspective through the application of the TOEI (Technological, Organisational, Environmental and Individual) innovation adoption framework. By doing so this project will obtain information that will help to better understand how non-technological innovations, i.e., open innovation practices are adopted and how it impacts individuals. You are invited to participate in a semi-structured interview, which will take you about an hour. You will then be asked to review the transcribed version of your interview and provide any comments or feedback if you feel it is necessary. Interviews will be conducted either online, e.g., Zoom or face-to-face in an agreed location between the researcher and participant, and in accordance with HKSAR Covid'19 social restrictions measures.

The testing should not result in any undue discomfort, but your interview will be recorded via audio recorder for further data analysis and transcription.

The information you provide as part of the project is the research data. Any research data from which you can be identified is known as personal data. Personal data does not include data where the identity has been removed (anonymous data). We will minimize our use of personal data in the study as much as possible. The researcher and his team of supervisors will have access to personal data and research data for the purposes of the study. Responsible members of The Hong Kong Polytechnic University may be given access for monitoring and/or audit of the research.

All information related to you will remain confidential and stored safely on the researcher's personal computer that can be accessed only via a secured password, which is known to the researchers only. Besides, the information you give during an interview will be codified and the codes will be only known to the researcher. The information collected will be kept until the researcher passes the defense, which is expected to happen in the second half of 2021. The Hong Kong Polytechnic University takes reasonable precautions to prevent the loss, misappropriation, unauthorized access or destruction of the information you provide.

You have every right to withdraw from the study before or during the interview process without penalty of any kind.

If you have any questions, you may ask our helpers now or later, even after the study has started.

You may contact Professor Chan (tel. no.: 2766 6805/ email: f.chan@) or Narmina Rahimli (email: narmina.rahimli@ ;) of PolyU under the following situations:

a. if you have any other questions in relation to the study;
b. if, under very rare conditions, you become injured as a result of your participation in the study; or
c. if you want to get access to/or change your personal data before the expiry date.

In the event you have any complaints about the conduct of this research study, you may contact the Human Subjects Ethics Sub-Committee of The Hong Kong Polytechnic University in writing (c/o Research Office of the University) stating clearly the responsible person and department of this study as well as the HSESC Reference Number.

Thank you for your interest in participating in this study.

Professor Chan
Principal Investigator/Chief Investigator

Hung Hom Kowloon Hong Kong 香港 九龍 紅磡

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APPENDIX B: FIRST PART OF THE INTERVIEW SCRIPT AND CONSENT FORM

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

CONSENT TO PARTICIPATE IN RESEARCH

An Empirical Investigation of Factors that Impact the Adoption of Open Innovation Practices as Management Innovation

I _____ hereby consent to participate in the captioned research conducted by Narmina Rahimli who is the student of the Hong Kong Polytechnic University.

I understand that information obtained from this research may be used in future research and published. However, my right to privacy will be retained, i.e., my personal details will not be revealed.

The procedure as set out in the attached information sheet has been fully explained. I understand the benefit and risks involved. My participation in the project is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without penalty of any kind.

Name of participant _____

Signature of participant _____

Name of researcher: Narmina Rahimli

Signature of researcher: _____

Date 05/11/2020

Hung Hom Kowloon Hong Kong 香港 九龍 紅磡

Tel 電話 (852) 2766 5111 Fax 傳真 (852)

Part A: Background information of participant

Please specify the following details in the table below

Socio Demographic Details	
Gender	
Age	
Education Level (Bachelor, Master, PhD etc.)	
Current Position	
Years of Professional Experience	
Countries of Current and Previous Residences	
Organisation's Details	
Size (N of employees)	
Industry/Main Services	
Establishment Year	

Part B: Purpose and terminology of the interview

The purpose of this interview is to understand what factors facilitate or hinder adoption of *Open Innovation practices (OI)* as *Management Innovation (MI)* from an individual/managerial level perspective through the application of the TOEI (Technological, Organisational, Environmental and Individual) innovation adoption framework. Thus, this interview considers OI practices as: *a) innovation itself; b) management innovation.*

For the terminology used *during this interview* see the table below. Please confirm that your understanding of the terms used is the same as outlined in the table. Please inform about any disagreements, corrections and comments you wish to make prior to the interview.

Term	Definition used in interview	Examples of Practices
Innovation	*"…an idea, practice, or project that is perceived as new by an individual or other unit of adoption"* (Rogers 2003, p.12)	
Open Innovation	OI as an umbrella term that incorporates open innovation practices that belong either to inbound or outbound OI.	
Inbound Open Innovation Practices	*Acquisition or sourcing of ideas, products, knowledge from outside of the organization.*	IP In-licensing, institutional collaboration, purchasing of scientific services, venture capital, acquisition, beta testing, contracting/outsourcing, crowdsourcing/ideation, innovation contests, lead users, open search, supplier integration, third-party intermediaries, toolkits, university partnerships, user communities.
Outbound Open Innovation	*Selling or free revealing of internally developed ideas, products, knowledge to external organisations to avoid spillover.*	Innovation providers, IP out-licensing, spinoffs, divest, supply of scientific services, external technology commercialisation.
Management Innovation	*"… changes how managers do what they do"* Hamel (2006, p.71)	New management practices, processes, structures, techniques, policies.

Final Note

The main interview will be structured across the following *three areas*:

1) General assessment of your knowledge on MI and OI.

2) Pre-adoption stage to discuss factors that impact adoption of OI practices within four contexts- Technological, Organisational, Environmental, Individual.

3) Post-adoption stage, where we discuss how the adoption of OI practices have impacted you from the personal well-being perspective i.e., work engagement, personal productivity, work satisfaction.

APPENDIX C: SECOND PART OF THE INTERVIEW SCRIPT

This is a semi structured interview, which means there are no structured answers and the interview will go with the flow.

Part C: General Understanding on OI and MI

1) How is MI operationalised within the context of your company?

2) How is OI operationalised within the context of your company?

3) Any OI practices from the list above that your organization practices and how effective are they? If your organisation does not practice any OI practices, please explain why.

4) To what extent the adoption of discussed practices resulted in the expected benefits? If no benefits were attained, then let's discuss challenges associated with the adoption of these practices, if any.

Part D: Adoption Stage

If you or the organisation you represent has adopted or planning to adopt OI practices how the following four contexts have impacted you.

Technological/ Practices itself

1) What are the general factors of these practices that impact their adoption in your organisation? Why?

2) Let's discuss the following specific OI practices' factors that can impact their adoption:

Relative advantage- To what extent the adopted practice (OI practice) helps to accomplish more tasks, provides better control and increases your productivity to before/old model and how this impacts adoption?

Compatibility- To what extent the OI practices fits well with the way you like to work, fits in your work style and how that impacts its adoption?

Complexity- To what extent it is easy to use/learn these OI practices and how it impacts their adoption?

Triallability – To what extent the fact that you can experiment/use with any of these OI practices impacts their adoption?

Organisational-Cultural

1) What are the general organisational factors that impact the adoption of OI practices in your organisation? Why?

2) What's the impact of the following specific organisational factors- *size, top management support, and organisational culture*- on the adoption of OI practices?

Environmental-Fashion-Institutional

1) What are the general environmental factors that impact the adoption of OI practices in your organisation? Why?

2) Let's discuss the following specific environmental factors in regard to OI adoption: What's the impact of *industry, fashion setters* (exposure to management conferences, exhibitions, forums, exposure to professional media outlets, management gurus etc.), institutional mechanisms, i.e., mimetic (do you adopt these practices to imitate your competitors, because you think their business model is better/successful in times of uncertainty/unclear goals?) , normative *(pressure of professional network, compliance demands from professionalization that are promoted by professionals/trade associations etc.),* coercive pressures (*regulations issued by gov and non gov agencies*) on the adoption of OI practices?

Individual-Rational

1) What are the general individual factors that impact the adoption of these practices in your organisation? Why?

2) Let's discuss the following specific individual factors that can possibly impact or hinder the adoption of OI practices: What's the impact of *manager's tenure, cosmopolitanism/ international experience, self-directed learning* on the adoption of OI practices?

Part E: Post Adoption Stage

According to Hamel (2006, p.71) the adoption of management innovations *"… changes how managers do what they do"*. Based on this statement let's discuss the adoption of OI practices as MI in the following context.

1) To what extent the adopted OI practices have changed /addressed the challenges associated with managers' daily routines in comparison to before (previous practices), met your expectations, and how did it personally affect you (less workload= you feel more happy etc.) ? Any OI practices in particular you would like to discuss? If there is no impact, please explain why you think so.

2) Specifically and based on the definitions provided below, how the adoption of OI practices impact your daily routines across the following three dimensions in comparison to before (previous practices):

- Work engagement *"…a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption. "* (Schaufeli et al., 2002, p.74). Do you find your work more meaningful? Do you feel bursting with energy? Do you feel more immense when working?
- Work satisfaction- "*the pleasurable emotional state resulting from the perception of one's job fulfilling or allowing the fulfilment of one's important job values*" Locke (1976, p.1342). Do you feel more content with your job?
- Personal productivity- *productivity is not only limited to efficiency and effectiveness, but also it describes things like absenteeism, turnover, innovation, morale and others.* Do you feel more engaged in your work and less absent? Do you generate more innovative ideas?

3) Do you want to add anything else?

Thank you for your time!

APPENDIX D: LIST OF THE OPEN INNOVATION PRACTICES

Participant N	Adoption Status	Inbound OI	Outbound OI
P1	Adopted	Beta-testing, outsourcing, acquisition, toolkits.	
P2	Adopted	Supplier integration, in-licensing, beta-testing, acquisition, service provider	Out-licensing
P3	Adopted	Outsourcing, In-licensing.	Innovation Provider, out-licensing, spinoffs
P4	Adopted	Outsourcing/contracting, university partnerships, institutional collaboration, user communities.	
P5	Adopted	Outsourcing	
P6	Adopted	IP in-licensing, institutional collaboration, purchasing of scientific services, beta-testing, third-party intermediaries, outsourcing.	Innovation Providers
P7	Adopted	Beta-testing, contracting/outsourcing, third party intermediaries, toolkits, acquisitions.	
P8	Adopted/Intend to adopt	Institutional collaboration, IP in-licensing, purchasing of scientific services, beta-testing, service provider	IP Out-licensing (intent to adopt)
P9	Adopted	Open Source, institutional collaboration, university partnerships.	IP Out-licensing
P10	Adopted	Institutional collaboration, venture capital, beta-testing, contracting/outsourcing, crowdsourcing/ideation, lead users, university partnerships, user communities, supplier integration.	Innovation providers
P11	Adopted	IP in licensing, acquisitions, contracting/outsourcing, supplier integration.	

P12	Adopted	IP in-licensing, beta testing, acquisition, venture capital, outsourcing, supplier integration, third party intermediaries, toolkits, user communities.	IP out-licensing.
P13	Adopted	Outsourcing/Contracting, supplier integration.	
P14			External technology commercialisation, IP out-licensing
P15	Adopted	Beta testing, user communities	External technology commercialisation
P16	Adopted	Venture capital, beta-testing, crowdsourcing, ideation, innovation contests, supplier integration, third party intermediaries, university partnerships, user communities	Out-licensing
P17	Adopted	Institutional Collaborations	
P18	Adopted	Institutional collaborations, purchasing of scientific services, venture, beta-testing, contracting/outsourcing, innovation contests, user communities, third party intermediaries	Innovation Providers, out-licensing
P19	Intend to adopt	Supplier integration, crowdsourcing, creative partnerships	Out licensing, innovation providers
P20	Adopted/intend to adopt	In licensing	
P21	Adopted/intend to adopt	Beta-testing, interorganisational innovation contests	Content-out licensing
P22	Adopted/intend to adopt	Suppliers integration, external technology commercialisation (?), 3rd party intermediaries	Out-licensing; spinoffs; selling way of working

Inbound: IP In-licensing, institutional collaboration, purchasing of scientific services, venture capital, acquisition, beta testing, contracting/outsourcing, crowdsourcing/ideation, innovation contests, lead users, open search, supplier integration, third-party intermediaries, toolkits, university partnerships, user communities.

Outbound: Innovation providers, IP out-licensing, spinoffs, divest, supply of scientific services, external technology commercialisation.

APPENDIX E: TERM FREQUENCY BASED ON WORDSTAT

	FREQUENCY	NO. CASES	% CASES	TF IDF
PEOPLE	366	21	95.45%	7.4
BUSINESS	214	17	77.27%	24
START	173	18	81.82%	15.1
INNOVATION	164	20	90.91%	6.8
PRODUCT	150	20	90.91%	6.2
TECHNOLOGY	149	17	77.27%	16.7
DATA	138	14	63.64%	27.1
TEAM	127	20	90.91%	5.3
ADOPT	124	19	86.36%	7.9
OPENINNOVATION	124	20	90.91%	5.1
CLIENT	121	12	54.55%	31.9
PARTNER	121	14	63.64%	23.8
CUSTOMER	119	10	45.45%	40.7
YEAR	119	18	81.82%	10.4
IMPACT	111	19	86.36%	7.1
OPEN	106	18	81.82%	9.2
TOOL	106	14	63.64%	20.8
IDEA	103	20	90.91%	4.3
PROCESS	100	20	90.91%	4.1
MARKET	95	16	72.73%	13.1
ORGANIZATION	94	18	81.82%	8.2
BRING	86	12	54.55%	22.6
MODEL	80	18	81.82%	7
CREATE	74	18	81.82%	6.4
DECISION	74	17	77.27%	8.3
FACTOR	74	19	86.36%	4.7
SERVICE	74	17	77.27%	8.3
EXTERNAL	73	16	72.73%	10.1
OUTSOURCE	73	12	54.55%	19.2
AGENCY	71	9	40.91%	27.6
SOLUTION	71	11	50.00%	21.4
MAKE	69	18	81.82%	6
PLATFORM	68	11	50.00%	20.5
TALK	68	18	81.82%	5.9
PROBLEM	65	14	63.64%	12.8
ADOPTION	63	16	72.73%	8.7

FEEL	63	18	81.82%	5.5
PROJECT	61	14	63.64%	12
BUILD	60	16	72.73%	8.3
SUPPORT	60	18	81.82%	5.2
UNIVERSITY	60	4	18.18%	44.4
BETATESTING	59	10	45.45%	20.2
DAY	59	14	63.64%	11.6
LEVEL	59	18	81.82%	5.1
LEARNING	57	18	81.82%	5
MONEY	57	13	59.09%	13
INNOVATIVE	56	11	50.00%	16.9
PROVIDE	56	17	77.27%	6.3
SUPPLIER	56	8	36.36%	24.6
RISK	55	10	45.45%	18.8
CALL	54	16	72.73%	7.5
HAPPEN	54	18	81.82%	4.7
SIDE	52	15	68.18%	8.6
STUFF	52	10	45.45%	17.8
SYSTEM	52	13	59.09%	11.9
SET	51	15	68.18%	8.5
CONTRACT	49	12	54.55%	12.9
SMALL	49	17	77.27%	5.5
BENEFIT	48	18	81.82%	4.2
END	48	14	63.64%	9.4
PARTY	48	15	68.18%	8
REGULATION	48	17	77.27%	5.4
CREATIVE	47	9	40.91%	18.2
MONTH	47	13	59.09%	10.7
USER	47	12	54.55%	12.4
DEVELOP	46	16	72.73%	6.4
JOB	46	17	77.27%	5.2
CHALLENGE	45	13	59.09%	10.3
REASON	45	11	50.00%	13.5
TEST	45	13	59.09%	10.3
EMPLOYEE	44	15	68.18%	7.3
FEEDBACK	44	11	50.00%	13.2
GROUP	44	14	63.64%	8.6
PARTNERSHIP	44	9	40.91%	17.1
SHARE	44	12	54.55%	11.6
DIFFICULT	42	13	59.09%	9.6
OFFER	42	14	63.64%	8.2
PAY	42	15	68.18%	7
TYPE	42	15	68.18%	7
LAUNCH	41	8	36.36%	18
RESULT	41	14	63.64%	8

CASE	40	17	77.27%	4.5
OPPORTUNITY	40	13	59.09%	9.1
TOP	40	15	68.18%	6.7
COMPETITOR	39	16	72.73%	5.4
MARKETING	39	10	45.45%	13.4
PUSH	39	10	45.45%	13.4
RESEARCH	39	9	40.91%	15.1
SENSE	39	13	59.09%	8.9
MANAGE	38	14	63.64%	7.5
MEDIUM	38	9	40.91%	14.8
SOLVE	38	4	18.18%	28.1
COUNTRY	37	15	68.18%	6.2
FOCUS	37	16	72.73%	5.1
INTERNALLY	37	11	50.00%	11.1
PERSON	37	16	72.73%	5.1
QUESTION	37	14	63.64%	7.3
ROLE	37	12	54.55%	9.7
SCALE	37	9	40.91%	14.4
SELL	37	14	63.64%	7.3
STAFF	37	12	54.55%	9.7
COLLABORATION	36	12	54.55%	9.5
ESSENTIALLY	36	10	45.45%	12.3
FIRM	36	7	31.82%	17.9
HIGH	35	17	77.27%	3.9
HOUSE	35	14	63.64%	6.9
PROGRAM	35	7	31.82%	17.4
SIZE	35	16	72.73%	4.8
CHINA	34	6	27.27%	19.2
COST	34	12	54.55%	9
DEVELOPMENT	34	12	54.55%	9
MENTION	34	15	68.18%	5.7
NECESSARILY	34	12	54.55%	9
ORDER	34	8	36.36%	14.9
POINT	34	16	72.73%	4.7
PROVIDER	34	10	45.45%	11.6
RUN	34	10	45.45%	11.6
TESTING	34	12	54.55%	9
DRIVE	33	14	63.64%	6.5
EARLY	33	12	54.55%	8.7
IMPLEMENT	33	12	54.55%	8.7
REQUIRE	33	8	36.36%	14.5
WORKS	33	12	54.55%	8.7
WORLD	33	11	50.00%	9.9
IMPROVE	32	9	40.91%	12.4
PART	32	13	59.09%	7.3

STAGE	32	14	63.64%	6.3
COMMUNITY	31	4	18.18%	23
INTERNAL	31	12	54.55%	8.2
PLAY	31	14	63.64%	6.1
SPEND	31	15	68.18%	5.2
ACROSS	30	12	54.55%	7.9
DELIVER	30	11	50.00%	9
EXIST	30	10	45.45%	10.3
LICENSING	30	11	50.00%	9
MOVE	30	16	72.73%	4.1
ANSWER	29	10	45.45%	9.9
CONTRACTOR	29	6	27.27%	16.4
COVID	29	12	54.55%	7.6
DIGITAL	29	9	40.91%	11.3
FORWARD	29	10	45.45%	9.9
GOVERNMENT	29	14	63.64%	5.7
GUY	29	8	36.36%	12.7
NUMBER	29	10	45.45%	9.9
PERSONALLY	29	12	54.55%	7.6
QUICKLY	29	10	45.45%	9.9
RESOURCE	29	14	63.64%	5.7
ABSOLUTELY	28	10	45.45%	9.6
FACT	28	12	54.55%	7.4
HIRE	28	15	68.18%	4.7
INDIVIDUAL	28	13	59.09%	6.4
INFORMATION	28	12	54.55%	7.4
INTEREST	28	14	63.64%	5.5
OPERATE	28	11	50.00%	8.4
BOARD	27	9	40.91%	10.5
BUY	27	13	59.09%	6.2
GOAL	27	10	45.45%	9.2
GOOGLE	27	11	50.00%	8.1
HONGKONG	27	11	50.00%	8.1
KEY	27	13	59.09%	6.2
LEARN	27	14	63.64%	5.3
MIND	27	14	63.64%	5.3
PRESSURE	27	11	50.00%	8.1
PROFESSIONAL	27	10	45.45%	9.2
REVENUE	27	9	40.91%	10.5
STRUCTURE	27	14	63.64%	5.3
AFTER	26	12	54.55%	6.8
AREA	26	12	54.55%	6.8
BANK	26	5	22.73%	16.7
EASIER	26	11	50.00%	7.8
GLOBAL	26	10	45.45%	8.9

SKILL	26	5	22.73%	16.7
TRIAL	26	13	59.09%	5.9
CLIMATE	25	1	4.55%	33.6
GROW	25	10	45.45%	8.6
INTEGRATION	25	10	45.45%	8.6
INVEST	25	10	45.45%	8.6
THING	25	14	63.64%	4.9
TODAY	25	7	31.82%	12.4
BANKING	24	2	9.09%	25
DECIDE	24	12	54.55%	6.3
DEPEND	24	9	40.91%	9.3
FOLLOW	24	11	50.00%	7.2
HONEST	24	7	31.82%	11.9
INVOLVE	24	13	59.09%	5.5
ONLINE	24	10	45.45%	8.2
POLICY	24	12	54.55%	6.3
REPORT	24	6	27.27%	13.5
SUPPLY	24	8	36.36%	10.5
BEGINNING	23	9	40.91%	8.9
CONTENT	23	12	54.55%	6.1
EASY	23	12	54.55%	6.1
ENGAGE	23	12	54.55%	6.1
EXPECT	23	13	59.09%	5.3
LICENSE	23	9	40.91%	8.9
LONG	23	13	59.09%	5.3
MATTER	23	15	68.18%	3.8
MEET	23	10	45.45%	7.9
NETWORK	23	7	31.82%	11.4
SIGN	23	11	50.00%	6.9
SPECIFIC	23	11	50.00%	6.9
UK	23	10	45.45%	7.9
VIEW	23	11	50.00%	6.9
ADVANTAGE	22	12	54.55%	5.8
DEAL	22	10	45.45%	7.5
FINANCIAL	22	9	40.91%	8.5
INNOVATE	22	10	45.45%	7.5
INTEGRATE	22	9	40.91%	8.5
LEADERSHIP	22	8	36.36%	9.7
OFFICE	22	11	50.00%	6.6
REVIEW	22	9	40.91%	8.5
VISION	22	8	36.36%	9.7
APPLY	21	6	27.27%	11.8
APPROACH	21	10	45.45%	7.2
CONCEPT	21	8	36.36%	9.2
CORE	21	12	54.55%	5.5

DEMAND	21	9	40.91%	8.2
MANAGER	21	13	59.09%	4.8
OPTION	21	6	27.27%	11.8
SPACE	21	11	50.00%	6.3
WIN	21	9	40.91%	8.2
COUPLE	20	11	50.00%	6
DEPARTMENT	20	6	27.27%	11.3
GENERAL	20	9	40.91%	7.8
LARGE	20	7	31.82%	9.9
LONGTERM	20	9	40.91%	7.8
STRATEGY	20	10	45.45%	6.8
AI	19	6	27.27%	10.7
CURRENT	19	11	50.00%	5.7
DIRECT	19	12	54.55%	5
FAST	19	9	40.91%	7.4
FREE	19	11	50.00%	5.7
ISSUE	19	9	40.91%	7.4
MULTIPLE	19	8	36.36%	8.3
REGION	19	8	36.36%	8.3
SHOW	19	8	36.36%	8.3
SUCCESS	19	7	31.82%	9.4
TECH	19	9	40.91%	7.4
BETA	18	6	27.27%	10.2
BRAND	18	7	31.82%	9
BUILDING	18	6	27.27%	10.2
COMPLEX	18	9	40.91%	7
FEATURE	18	7	31.82%	9
HARD	18	9	40.91%	7
INSURANCE	18	4	18.18%	13.3
LINE	18	8	36.36%	7.9
MOMENT	18	9	40.91%	7
PERSONAL	18	11	50.00%	5.4
PLAN	18	11	50.00%	5.4
PRETTY	18	9	40.91%	7
REAL	18	8	36.36%	7.9
REPUTATION	18	11	50.00%	5.4
SITUATION	18	10	45.45%	6.2
SPECIFICALLY	18	11	50.00%	5.4
STUDENT	18	2	9.09%	18.7
TRADITIONAL	18	4	18.18%	13.3
ACCESS	17	8	36.36%	7.5
CONFERENCE	17	11	50.00%	5.1
CROWDSOURCING	17	5	22.73%	10.9
EFFICIENT	17	11	50.00%	5.1
EXPERTISE	17	5	22.73%	10.9

HAPPY	17	12	54.55%	4.5
INFLUENCE	17	5	22.73%	10.9
INTELLECTUALPROPERTY	17	5	22.73%	10.9
JOIN	17	9	40.91%	6.6
LEAD	17	8	36.36%	7.5
LONGER	17	10	45.45%	5.8
NATURALLY	17	6	27.27%	9.6
PREVIOUS	17	7	31.82%	8.5
SEND	17	9	40.91%	6.6
SUCCESSFUL	17	12	54.55%	4.5
TRACK	17	6	27.27%	9.6
COMPLICATE	16	6	27.27%	9
CONVERSATION	16	8	36.36%	7
FLEXIBLE	16	9	40.91%	6.2
FORM	16	10	45.45%	5.5
KNOWLEDGE	16	10	45.45%	5.5
PAST	16	5	22.73%	10.3
PLAYER	16	5	22.73%	10.3
ALIGN	15	10	45.45%	5.1
ASIA	15	9	40.91%	5.8
COMMERCIAL	15	5	22.73%	9.7
COMPATIBLE	15	9	40.91%	5.8
CONTINUE	15	8	36.36%	6.6
FIELD	15	3	13.64%	13
FUTURE	15	9	40.91%	5.8
GREAT	15	8	36.36%	6.6
HOME	15	6	27.27%	8.5
HUMAN	15	7	31.82%	7.5
INTRODUCE	15	6	27.27%	8.5
LIST	15	9	40.91%	5.8
LIVE	15	10	45.45%	5.1
OPENSOURCE	15	3	13.64%	13
PLANNING	15	6	27.27%	8.5
PRICE	15	5	22.73%	9.7
REQUIREMENT	15	9	40.91%	5.8
ROLL	15	7	31.82%	7.5
TRAINING	15	7	31.82%	7.5
VENTURE	15	6	27.27%	8.5
WRONG	15	6	27.27%	8.5

APPENDIX F: PHRASES FREQUENCY BASED ON WORDSTAT

	FREQUENCY	NO. CASES	% CASES	LENGTH	TF IDF
MANAGEMENT INNOVATION	21	11	50.00%	2	6.3
BUSINESS MODEL	20	10	45.45%	2	6.8
OPENINNOVATION PRACTICE	19	12	54.55%	2	5
TOP MANAGEMENT	19	10	45.45%	2	6.5
BIG COMPANY	17	8	36.36%	2	7.5
EXTERNAL FACTOR	17	10	45.45%	2	5.8
CLIMATE CHANGE	15	1	4.55%	2	20.1
FASHION SETTER	14	13	59.09%	2	3.2
YEAR AGO	13	8	36.36%	2	5.7
CUSTOMER PROBLEM	12	1	4.55%	2	16.1
DIRECT LEARNING	12	8	36.36%	2	5.3
INTERNATIONAL EXPERIENCE	12	11	50.00%	2	3.6
SUPPLY INTEGRATION	12	4	18.18%	2	8.9
EXTERNAL TECHNOLOGY	11	3	13.64%	2	9.5
INSTITUTIONAL COLLABORATION	11	4	18.18%	2	8.1
ADOPT OPENINNOVATION	10	3	13.64%	2	8.7
DECISION MAKE	10	4	18.18%	2	7.4
GOVERNMENT REGULATION	10	8	36.36%	2	4.4
SMALL COMPANY	10	5	22.73%	2	6.4
START UP SOLUTION	10	1	4.55%	3	13.4
USER COMMUNITY	10	4	18.18%	2	7.4
BETA TESTING	9	6	27.27%	2	5.1
END HAVE THE DAY	9	4	18.18%	4	6.7
POINT HAVE VIEW	9	4	18.18%	3	6.7
PRODUCT FORWARD	9	1	4.55%	2	12.1
REAL ESTATE	9	3	13.64%	2	7.8
PARTY INTERMEDIARY	8	6	27.27%	2	4.5
STAFF MEMBER	8	3	13.64%	2	6.9
TOP MANAGEMENT SUPPORT	8	7	31.82%	3	4
WORK FROM HOME	8	3	13.64%	3	6.9
EARLY STAGE	7	4	18.18%	2	5.2
IMPACT THE ADOPTION	7	5	22.73%	3	4.5
INNOVATIVE SOLUTION	7	4	18.18%	2	5.2
INSURANCE COMPANY	7	3	13.64%	2	6.1
LONG TIME	7	5	22.73%	2	4.5

PERSONAL LEVEL	7	5	22.73%	2	4.5
PHYSICAL RISK	7	1	4.55%	2	9.4
PLAY A PART	7	1	4.55%	3	9.4
STAKEHOLDER MANAGEMENT	7	1	4.55%	2	9.4
START UP PARTNER	7	1	4.55%	3	9.4
UNIVERSITY PARTNERSHIP	7	1	4.55%	2	9.4
ADOPT THESE PRACTICE	6	5	22.73%	3	3.9
CONTRACT AND OUTSOURCE	6	2	9.09%	3	6.2
DAY TO DAY	6	5	22.73%	3	3.9
EXTERNAL SUPPLIER	6	3	13.64%	2	5.2
FREE TRIAL	6	5	22.73%	2	3.9
IMPORTANT FACTOR	6	4	18.18%	2	4.4
LICENSING AGREEMENT	6	1	4.55%	2	8.1
MIND SET	6	4	18.18%	2	4.4
OPEN PLATFORM	6	2	9.09%	2	6.2
PREVIOUS JOB	6	3	13.64%	2	5.2
PROFESSIONAL NETWORK	6	4	18.18%	2	4.4
PUSH OUR PRODUCT FORWARD	6	1	4.55%	4	8.1
TIME TO MARKET	6	2	9.09%	3	6.2
BUSINESS SKILL	5	1	4.55%	2	6.7
CLIMATE RISK	5	1	4.55%	2	6.7
CONTENT WITH MY JOB	5	5	22.73%	4	3.2
COUPLE HAVE YEAR	5	4	18.18%	3	3.7
CROWDSOURCING MODEL	5	1	4.55%	2	6.7
DIGITAL MARKETING	5	2	9.09%	2	5.2
EARLY ADOPTER	5	4	18.18%	2	3.7
FULL TIME	5	2	9.09%	2	5.2
FUTURISTIC TECHNOLOGY	5	1	4.55%	2	6.7
HIGH LEVEL	5	3	13.64%	2	4.3
IMITATE OUR COMPETITOR	5	5	22.73%	3	3.2
INDIVIDUAL FACTOR	5	5	22.73%	2	3.2
INNOVATION PROVIDER	5	4	18.18%	2	3.7
INNOVATIVE IDEA	5	3	13.64%	2	4.3
LARGE ORGANIZATION	5	2	9.09%	2	5.2
MANAGE PEOPLE	5	4	18.18%	2	3.7
MARKET OPPORTUNITY	5	1	4.55%	2	6.7
MARKETING AND ADVERTISING	5	1	4.55%	3	6.7
MARKETING PLATFORM	5	1	4.55%	2	6.7
MID STAGE START	5	1	4.55%	3	6.7
OPEN MIND	5	4	18.18%	2	3.7
OPEN TO LEARNING	5	1	4.55%	3	6.7
ORDER TO SOLVE	5	1	4.55%	3	6.7
PLAY A ROLE	5	4	18.18%	3	3.7
SERVICE LEVEL	5	2	9.09%	2	5.2
SHARE DATA	5	2	9.09%	2	5.2

SOLVE CUSTOMER PROBLEM	5	1	4.55%	3	6.7
SUPPLIER INTEGRATION	5	4	18.18%	2	3.7
TECHNICAL SKILL	5	1	4.55%	2	6.7
TECHNOLOGY PROVIDER	5	3	13.64%	2	4.3
TRACK RECORD	5	1	4.55%	2	6.7
TRADE BODY	5	3	13.64%	2	4.3
WORK MORE MEANINGFUL	5	5	22.73%	3	3.2
WORK WITH PEOPLE	5	4	18.18%	3	3.7
WORK WITH THIRD PARTY	5	4	18.18%	4	3.7
ACADEMIC INSTITUTION	4	1	4.55%	2	5.4
ANALYTICAL SKILL	4	1	4.55%	2	5.4
ASSET MANAGEMENT HOUSE	4	1	4.55%	3	5.4
BAD ACTOR	4	1	4.55%	2	5.4
BOTTOM LINE	4	2	9.09%	2	4.2
COLLECT DATA	4	2	9.09%	2	4.2
COMPANY I WORK	4	3	13.64%	3	3.5
CONTENT MANAGEMENT	4	1	4.55%	2	5.4
CONTRACT OR OUTSOURCE	4	1	4.55%	3	5.4
CREATIVE MANAGEMENT	4	1	4.55%	2	5.4
CREATIVE PARTNER	4	1	4.55%	2	5.4
CREATIVE TEMPLATE	4	1	4.55%	2	5.4
CREDIT RISK	4	1	4.55%	2	5.4
DATA COMPANY	4	3	13.64%	2	3.5
DIGITAL COMPANY	4	1	4.55%	2	5.4
DRIVE INNOVATION	4	2	9.09%	2	4.2
EXTERNAL COLLABORATION	4	2	9.09%	2	4.2
EXTERNAL PARTY	4	3	13.64%	2	3.5
FLIP SIDE	4	3	13.64%	2	3.5
GOOD SET	4	1	4.55%	2	5.4
INNOVATE OUR PRODUCT	4	3	13.64%	3	3.5
INNOVATIVE PRACTICE	4	2	9.09%	2	4.2
JOB SATISFACTION	4	3	13.64%	2	3.5
LOCAL OFFICE	4	2	9.09%	2	4.2
LOSE MONEY	4	3	13.64%	2	3.5
MACHINE LEARNING	4	3	13.64%	2	3.5
MANAGEMENT PRACTICE	4	2	9.09%	2	4.2
MANAGEMENT STRUCTURE	4	4	18.18%	2	3
MANAGERIAL PRACTICE	4	3	13.64%	2	3.5
MEDIUM COMPANY	4	1	4.55%	2	5.4
MEDIUM PLANNING	4	1	4.55%	2	5.4
MINING CUSTOMER	4	1	4.55%	2	5.4
ORGANIZATIONAL CULTURE	4	2	9.09%	2	4.2
PARTY PROVIDER	4	2	9.09%	2	4.2
PEOPLE FEEL	4	2	9.09%	2	4.2
PLANNING TOOL	4	1	4.55%	2	5.4

PREVIOUS COMPANY	4	2	9.09%	2	4.2
PROFESSIONAL DEVELOPMENT	4	1	4.55%	2	5.4
PROPRIETARY TOOL	4	2	9.09%	2	4.2
RECUR REVENUE	4	2	9.09%	2	4.2
REPETITIVE TASK	4	2	9.09%	2	4.2
SENIOR MANAGER	4	4	18.18%	2	3
SERVICE PROVIDER	4	2	9.09%	2	4.2
SMALL BUSINESS	4	2	9.09%	2	4.2
SPEND A LOT HAVE TIME	4	3	13.64%	5	3.5
STATUS QUO	4	2	9.09%	2	4.2
TECHNOLOGICAL INNOVATION	4	2	9.09%	2	4.2
TIME CONSUME	4	3	13.64%	2	3.5
USER EXPERIENCE	4	3	13.64%	2	3.5
VENTURE CAPITAL	4	4	18.18%	2	3
YEAR CONTRACT	4	3	13.64%	2	3.5
ACROSS THE WORLD	3	3	13.64%	3	2.6
ADOPT THE TECHNOLOGY	3	2	9.09%	3	3.1
ADOPT THESE OPEN	3	2	9.09%	3	3.1
AFFILIATE CREATIVE PROGRAM	3	1	4.55%	3	4
AI PARTNER	3	1	4.55%	2	4
AMOUNT HAVE TIME	3	2	9.09%	3	3.1
BANKING GROUP	3	1	4.55%	2	4
BENEFIT TO THE COMPANY	3	1	4.55%	4	4
BIG CHANGE	3	3	13.64%	2	2.6
BIG FACTOR	3	3	13.64%	2	2.6
BIG PART	3	3	13.64%	2	2.6
BIG PROBLEM	3	2	9.09%	2	3.1
BUSINESS PARTNER	3	3	13.64%	2	2.6
BUSINESS POTENTIAL	3	2	9.09%	2	3.1
CLIENT BASE	3	2	9.09%	2	3.1
COMPANY CALL	3	2	9.09%	2	3.1
CONSULT SERVICE	3	2	9.09%	2	3.1
CORE COMPETENCY	3	1	4.55%	2	4
COUPLE HAVE MONTH	3	2	9.09%	3	3.1
CREATIVE ENTERPRISE	3	1	4.55%	2	4
CROWD SOURCE	3	2	9.09%	2	3.1
CULTURAL JOURNEY	3	1	4.55%	2	4
CUSTOMER BASE	3	1	4.55%	2	4
DATA AND STUFF	3	1	4.55%	3	4
DATA EXCHANGE	3	1	4.55%	2	4
DATA PARTNER	3	1	4.55%	2	4
DELIVER RESULT	3	2	9.09%	2	3.1
DEVELOPMENT TEAM	3	3	13.64%	2	2.6
DIGITAL MEDIUM	3	1	4.55%	2	4
EARLY ADOPTION	3	3	13.64%	2	2.6

ENGAGE AND INNOVATIVE	3	1	4.55%	3	4
ENVIRONMENTAL FACTOR	3	3	13.64%	2	2.6
EXPAND OUR PRODUCT	3	1	4.55%	3	4
EXPECT BENEFIT	3	3	13.64%	2	2.6
EXPIRATION DATE	3	1	4.55%	2	4
EXTERNAL PARTNERSHIP	3	3	13.64%	2	2.6
EXTERNAL TOOL	3	1	4.55%	2	4
FAIRLY QUICKLY	3	2	9.09%	2	3.1
FEEL MORE ENGAGE	3	3	13.64%	3	2.6
FINANCIAL SERVICE	3	2	9.09%	2	3.1
FOCUS GROUP	3	2	9.09%	2	3.1
FUNDAMENTAL AIM	3	1	4.55%	2	4
GLOBAL COMPANY	3	1	4.55%	2	4
GOOD IDEA	3	2	9.09%	2	3.1
GOOD THING	3	2	9.09%	2	3.1
GOOD UNIVERSITY	3	1	4.55%	2	4
GREAT QUESTION	3	2	9.09%	2	3.1
GROUP HAVE PEOPLE	3	1	4.55%	3	4
GUT FEELING	3	2	9.09%	2	3.1
INDEPENDENT FREELANCER	3	1	4.55%	2	4
INDIVIDUAL LEVEL	3	3	13.64%	2	2.6
INNOVATION CONTEST	3	3	13.64%	2	2.6
INTERNAL PROCESS	3	2	9.09%	2	3.1
INVOLVE IN THE CODE	3	1	4.55%	4	4
LOCAL UNIVERSITY	3	1	4.55%	2	4
MANAGERIAL TENURE	3	3	13.64%	2	2.6
MANUAL WORK	3	3	13.64%	2	2.6
MARKETING CAMPAIGN	3	1	4.55%	2	4
MEDIUM BRAND	3	1	4.55%	2	4
NATURAL LANGUAGE PROCESSING	3	1	4.55%	3	4
NUMBER HAVE YEAR	3	3	13.64%	3	2.6
OPEN INTERNET	3	1	4.55%	2	4
OPEN PRACTICE	3	2	9.09%	2	3.1
OPERATIONAL WORKFLOW	3	1	4.55%	2	4
PEOPLE LEAVE	3	3	13.64%	2	2.6
PEOPLE WORK	3	3	13.64%	2	2.6
PHYSICAL PRESENCE	3	1	4.55%	2	4
POTENTIAL CUSTOMER	3	1	4.55%	2	4
PREVIOUS AGENCY	3	2	9.09%	2	3.1
PROCESS IN PLACE	3	2	9.09%	3	3.1
PROOF HAVE CONCEPT	3	2	9.09%	3	3.1
PUSH PEOPLE	3	2	9.09%	2	3.1
REG TECH	3	1	4.55%	2	4
RUN OUR BUSINESS	3	3	13.64%	3	2.6
SENTIMENT ANALYSIS	3	1	4.55%	2	4

SERVICE PLAYER	3	1	4.55%	2	4
SHARE IDEA	3	3	13.64%	2	2.6
SIGN THE CONTRACT	3	2	9.09%	3	3.1
SIZE HAVE THE COMPANY	3	2	9.09%	4	3.1
SMART PEOPLE	3	3	13.64%	2	2.6
STAKEHOLDER MANAGEMENT SKILL	3	1	4.55%	3	4
START WITH CONTRACT	3	1	4.55%	3	4
STRUGGLE WITH TIME	3	1	4.55%	3	4
TALK TO PEOPLE	3	2	9.09%	3	3.1
TECH COMPANY	3	2	9.09%	2	3.1
TECH SOLUTION	3	1	4.55%	2	4
TECHNOLOGY COMPANY	3	3	13.64%	2	2.6
TIME ZONE	3	3	13.64%	2	2.6
TOP UNIVERSITY	3	2	9.09%	2	3.1
TRADITIONAL BUSINESS	3	1	4.55%	2	4
TRANSITION RISK	3	1	4.55%	2	4
TYPE HAVE INNOVATION	3	3	13.64%	3	2.6
WORK FOR PEOPLE	3	2	9.09%	3	3.1
WORK IN THE INDUSTRY	3	3	13.64%	4	2.6
WORK WITH PARTNER	3	3	13.64%	3	2.6